

**Five-Year Review Report**

**First Five-Year Review Report  
for  
T H Agriculture & Nutrition  
Operable Unit 1  
Albany, Dougherty County, Georgia**

**March 2003**

**PREPARED BY:**

**United States Environmental Protection Agency  
Region 4  
Atlanta, Georgia**

**and**

**T H Agriculture & Nutrition, L.L.C.**

Approved by: 

**Winston A. Smith, Director  
Waste Management Division  
U.S. EPA, Region 4**

Date: 9-4-03

10097773



## Table of Contents

List of Acronyms .....	i
Executive Summary .....	ii
Five-Year Review Summary Form .....	iii
<b>I. Introduction .....</b>	<b>1</b>
<b>II. Site Chronology .....</b>	<b>2</b>
<b>III. Background .....</b>	<b>2</b>
Physical Characteristics .....	2
Land and Resource Use .....	4
History of Contamination .....	4
Initial Response .....	4
Basis for Taking Action .....	5
<b>IV. Remedial Actions .....</b>	<b>5</b>
Remedy Selection .....	5
Remedy Implementation .....	7
System Operations/Operation and Maintenance (O&M) .....	13
<b>V. Progress Since the Last Five-Year Review .....</b>	<b>13</b>
<b>VI. Five-Year Review Process .....</b>	<b>13</b>
Community Involvement .....	13
Document Review .....	13
Data Review .....	14
Site Inspection .....	14
Interviews .....	14
<b>VI. Technical Assessment .....</b>	<b>14</b>
Question A: Is the remedy functioning as intended by the decision documents? .....	14
Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAO's) used at the time of the remedy still valid? .....	15
Question C: Has any other information come to light that could call into question the protectiveness of the remedy? .....	15
Technical Assessment Summary .....	16
<b>VIII. Issues .....</b>	<b>16</b>
<b>IX. Recommendations and Follow-up Actions .....</b>	<b>16</b>
<b>X. Protectiveness Statement .....</b>	<b>17</b>

<b>XI. Next Review</b>	17
------------------------	----

#### **Tables**

Table 1 - Chronology of Site Events	2
Table 2 - Groundwater Remediation Performance Standards	6
Table 3 - Issues	16

#### **Figures**

Figure 1 - Site Location Map	3
Figure 2 - Estimated NAPL Extent and Thickness, 1991	8
Figure 3 - Location of Monitoring Wells, Piezometers, Reinfiltration Wells, and Extraction Wells	9
Figure 4 - Area of Attainment - 1995	11
Figure 5 - Area of Attainment - 2001	12

#### **Appendices**

Appendix A - Tables	
Appendix B - Maps	
Appendix C - Graphs	

## List of Acronyms

CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
NAPL	Non-Aqueous Phase Liquid
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision

## **Executive Summary**

The remedy for the T H Agriculture and Nutrition, Operable Unit 1 (OU-1) site in Albany, Georgia, included excavation, off-site disposal, thermal desorption of soils, and a pump and treat remedy of contaminated water. The trigger for this five-year review was the actual start of construction on April 29, 1996.

The assessment of this five-year review found that a protectiveness determination of the pump and treat remedy cannot be made at this time until EPA completes its review of the five-year groundwater data related to the remedial action. It appears that the pump and treat remedy is not working, but for reasons unknown. The review of the groundwater data and possible remedy alternatives will take approximately one year to complete. New wells may have to be drilled in order to understand the groundwater movement patterns and new remedies may have to be studied. A protectiveness determination will be made when the EPA reviews all of the groundwater data and the optional remedy alternatives if necessary.

### Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: T H Agriculture and Nutrition, Operable Unit 1		
EPA Id: GAD042101261		
Region: 4	State: Georgia	City/County: Albany, Dougherty
SITE STATUS		
NPL Status: Final		
Remediation Status: Operating		
Multiple OUs? Yes	Construction Completion Date: N/A	
Has site been put into reuse? Yes (Commercial)		
REVIEW STATUS		
Lead Agency: EPA		
Author Name: Humberto A. Guzman		
Author Title: Remedial Project Manager	Author Affiliation: U.S. EPA Region 4	
Review Period: 01/02/02 to 03/31/03		
Date of Site Inspection: N/A		
Type of Review: Post-SARA		
Review number: First review		
Triggering action: Actual On-Site Construction on OU-1		
Triggering action date: April 29, 1996		
Due date: January 31, 2003		

Issues: N/A

Recommendations and Follow-up Actions: N/A

**Protectiveness Statement:** The assessment of this five-year review found that a protectiveness determination of the pump and treat remedy cannot be made at this time until EPA completes it's review of the five-year groundwater data related to the remedial action. It appears that the pump and treat remedy is not working, but the reasons for that are unknown.

Long-term Protectiveness: N/A

Other Comments: N/A

**T H Agriculture and Nutrition Site  
Operable Unit 1  
Albany, Georgia  
Five-Year Review Report**

**I. Introduction**

The purpose of a five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify any issues found during the review and make recommendations to address them.

The Five-Year Review requirement applies to all remedial actions selected under Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or the Superfund Act). Section 121 of CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), require that periodic reviews be conducted at least every five years for sites where hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure following the completion of all remedial actions. In June 2001, EPA's Office of Emergency and Remedial Response published the Comprehensive Five-Year Review Guidance, which provides the recommended structure for this review. The guidance is referenced as publication number EPA 540-R-01-007, or OWSER No. 9355.7-03B-P, and is also available on the EPA web site at <<http://www.epa.gov/superfund/pubs.htm>>

On June 20, 2002, T H Agriculture & Nutrition, L.L.C., the Potentially Responsible Party (PRP) for Operable Unit 1 (OU-1), submitted a Five-Year Review Report to the U.S. Environmental Protection Agency Region 4 (EPA). This is the first Five-Year Review for the site which has two operable units. This is a statutory Five-Year Review and the trigger date is defined as five years from the date that actual RA on-site construction is initiated. The legal trigger date for this site is April 29, 1996. Construction of the pump and treat system was completed in April 1997 and a long term pilot study of the system was completed in October 1997. At this site, the construction of the system was initiated 1.5 years before the remedy was actually started.

The PRP for Operable Unit 2 (OU-2) is Boise Cascade Corporation. Remedial Action at OU-2 commenced in September 1999 and was completed in January 2000. In February 2000, EPA discovered that a laboratory used by the PRP allegedly committed fraud. Two separate soil sampling events, one by the PRP and the other by EPA, in the Summer of 2000 concluded that contaminated soil, at concentrations above the Remedial Action Objectives (RAOs) listed in the Record of Decision (ROD), remain in place. The EPA has asked Boise Cascade to complete a second RA, but they are unwilling to do such at the present time. The trigger date for a statutory Five-Year Review for OU-2 will be when the second RA is initiated.

## II. Site Chronology

Table 1: Chronology of Site Events

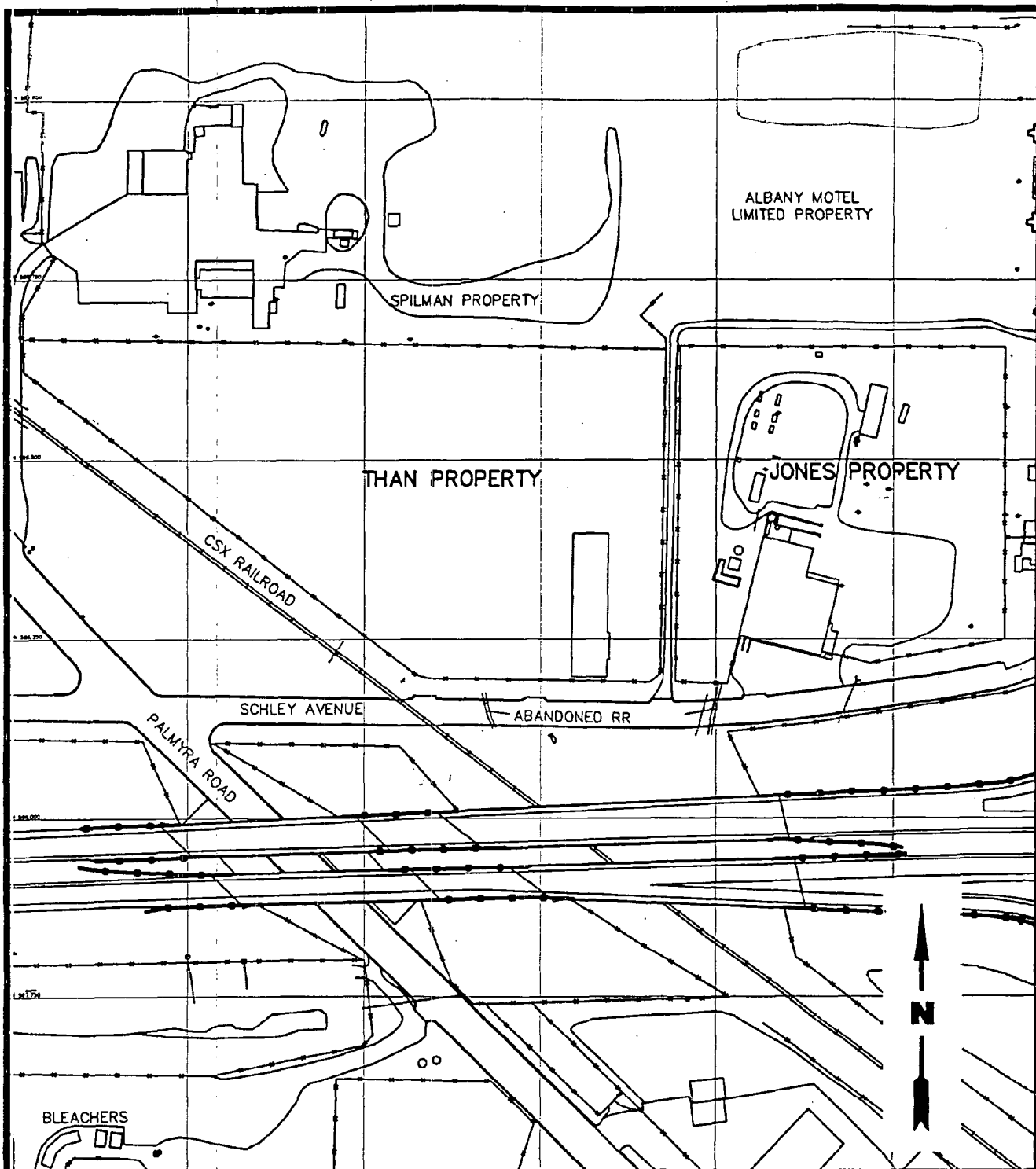
Event	Date
Initial Discovery of problem or contamination	Spring 1984
Pre-NPL Responses	July 1984 (Removal by Georgia EPD)
NPL Listing	March 31, 1989
Removal Actions Initiated	July 1984 (GaEPD), March 23, 1992 (EPA)
RI/FS Complete	May 21, 1993
ROD Signed	May 21, 1993
ROD Amendments or ESD's	N/A
Enforcement Documents Unilateral Administrative Order (UAO) Consent Decree Administrative Order on Consent (AOC)	AOC - July 6, 1990 UAO - March 30, 1992 Consent Decree - May 28, 2002
Remedial Design Start	November 1, 1993
Remedial Design Complete	November 29, 1995
Actual Remedial Action Start	November 29, 1995
Construction Dates (Start, Finish)	April 29, 1996, April 2, 1997
1 <sup>st</sup> Five Year Review (Report completed)	March 31, 2003

## III. Background

### Physical Characteristics

The T H Agriculture & Nutrition Company Superfund Site (Site) is a twelve acre site that includes two properties (Figure 1). The western 7 acres of the Site are owned by T H Agriculture & Nutrition, L.L.C. (THAN, formerly T H Agriculture & Nutrition Company, Inc.) and are located at 1401 Schley Avenue in Albany, Georgia (THAN property). The eastern 5





# **LEGEND:**

✕✕ FENCE

== RAILROAD TRACKS

200 0 200 400



SCALE IN FEET

T H AGRICULTURE & NUTRITION  
ALBANY, GEORGIA

**Woodward-Clyde Consultants**  
Engineers, Geologists, And Environmental Scientists



## **SITE LOCATION MAP**

DRAWN: J.W.B.	DATE: 5/7/97	PROJECT NUMBER	DWG. NO.
CHECKED: <i>[Signature]</i>	DATE: 5/7/97	89C7708	1

May 07, 1997 3:44:48 p.m.  
Drawing: K:\THAN\89C7708\89770808.DWG (JWB)  
Xrefs: ALBREF11.DWG AREF11TX.DWG

acres are located at 1359 Schley Avenue and are owned by Mr. Larry Jones (Jones property). The remedial action for OU-1 includes the remediation of groundwater under the entire 12 acres. OU-2 includes the remediation of soil (not included in this review) on the 5-acre eastern parcel owned by Mr. Larry Jones. The lead Potentially Responsible Party (PRP) for OU-2 is Boise Cascade Corporation. The protection and remediation of groundwater is the priority at the Site.

#### Land and Resource Use

The Site consists of two former pesticide formulation facilities located on THAN property and the Jones property. Various liquids and dry formulations of pesticides and other chemical compounds were handled at the two former facilities for a period of approximately thirty years. Mr. Jones has a welding supply store on his property and leases a warehouse the property owned by the THAN company. The Site is located in an industrial area, but there are some residential areas nearby. There are no environmentally sensitive (ecological) environments in the area. Deed restrictions are in place to keep the Site as an industrial site.

#### History of Contamination

The majority of business operations at the THAN property were conducted from 1950s to 1978 with all operations ceasing in 1982. THAN conducted removal activities at the Site in 1984 to remove surficial soils in accordance with a cleanup plan approved by the Georgia Environmental Protection Division (GaEPD). The cleanup plan identified areas of soil exceeding cleanup criteria established by GaEPD based on leachable organochlorine pesticides concentrations as measured using the Extraction Procedure (EP) Toxicity test method.

Extensive remedial activities were conducted on the THAN property in cooperation with GaEPD from July through September 1984. Major remedial activities included demolition of several buildings, excavation of selected surface soils and subsurface disposal areas, installation of a perimeter fence, and establishment of vegetative cover. Excavated soils and debris were removed and disposed off-site in a permitted hazardous waste landfill. During removal, soil excavation continued until GaEPD-specified cleanup criteria were met. Soil samples were collected and analyzed during and after excavation activities to confirm satisfaction of the GaEPD cleanup criteria.

#### Initial Response

THAN conducted a Remedial Investigation/Feasibility Study (RI/FS) in accordance with an Administrative Order by Consent (AOC) on OUI. Results of the RI (Woodward-Clyde, 1992) confirmed that organochlorine pesticides (OCPs) were the primary constituents of concern in the soils and groundwater at the Site. Shallow monitoring wells beneath the source areas contained the highest concentrations of OCPs and volatile organic compounds (VOCs).

Following the RI, THAN initiated a soil removal action on the THAN property in March 1992 in accordance with a Unilateral Administrative Order (UAO) for Removal Response Activities. Approximately 24,700 tons of soil and debris were removed and disposed at a permitted hazardous waste landfill. Roughly 4,300 tons of soil were treated on-site using low temperature thermal desorption. Excavated areas were backfilled and a uniform vegetative cover was placed over the entire THAN property. The Removal Action was concluded in January 1994.

A Feasibility Study was prepared and submitted to the USEPA which developed Remedial Action Objectives (RAOs) for the Site. The remedy selected by USEPA in the Record of Decision (ROD) issued on May 21, 1993 included extraction, on-site treatment, and on/off site disposal for groundwater, extraction and off-site incineration of Light Non-Aqueous Phase Liquid (LNAPL), and construction of a vegetative cover.

The ROD for this Site organized the remedial action at the two operable units. These units are:

- Operable Unit One: Contamination in the residuum and the upper Ocala aquifers underneath the entire Site and contamination of soils on the western portion (the THAN property) of the Site.
- Operable Unit Two: Contamination of the soils on the eastern portion (the Jones property) of the Site.

#### Basis For Taking Action

The remedial actions described in the ROD were implemented to address impacted groundwater remaining at the Site. Remedial action objectives were developed for groundwater, which were designed to protect human health and the environment.

### **IV. Remedial Actions**

#### Remedy Selection

Based on evaluation of alternatives presented in the Feasibility Study, and the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act, the National Contingency Plan and public and state comments, the USEPA selected an extraction and treatment remedy for OU1 groundwater and LNAPL contamination. The ROD for OU1 (USEPA, 1993) included the following:

- No action with respect to soils because the previous removal action mitigated the threat posed by the contaminated soils.

- Quarterly monitoring and maintenance of the vegetative cover established as part of the soil Removal Action.
- Extraction of the non-aqueous phase liquid for off-site incineration.
- Extraction of groundwater with subsequent on-site treatment by ultraviolet oxidation with possible granulated carbon adsorption as a polishing step, if needed, or other demonstrated treatment technologies.
- Discharging the treated water to an on-site infiltration gallery, or to the local Publicly Owned Treatment Works (POTW) with a permit from the City of Albany, or to a local surface water body via a National Pollutant Discharge Elimination System (NPDES) permit.
- Monitoring to determine the effectiveness of the groundwater extraction in reducing contaminant migration and affecting contaminant mass removal.
- Institutional controls for land use and groundwater restrictions.
- The Remedial Design, approved November 29, 1995, included design analyses and calculations, specifications, general provisions and special requirements necessary to translate the ROD into the remedy.
- THAN began construction for the groundwater remedial action on April 29, 1996.

The ROD states that groundwater is to be treated until the performance standards (RAO concentrations) are attained in Site groundwater. These concentrations are presented below:

Table 2: Groundwater Remediation Performance Standards

Constituent	Performance Standard Concentration ( $\mu\text{g/L}$ )
DDT	27
Toxaphene	3
alpha-BHC	4.1
beta-BHC	5.1
Aldrin	0.54
Dieldrin	0.57
1,2-Dibromoethane (EDB)	0.05

## Remedy Implementation

The UAO issued to THAN on October 7, 1993 directed THAN to conduct an RD/RA for groundwater at the Site. The groundwater remedy consists of groundwater extraction, treatment, and infiltration systems. In addition, a pilot-test dual-phase vacuum extraction (DVE) system was installed.

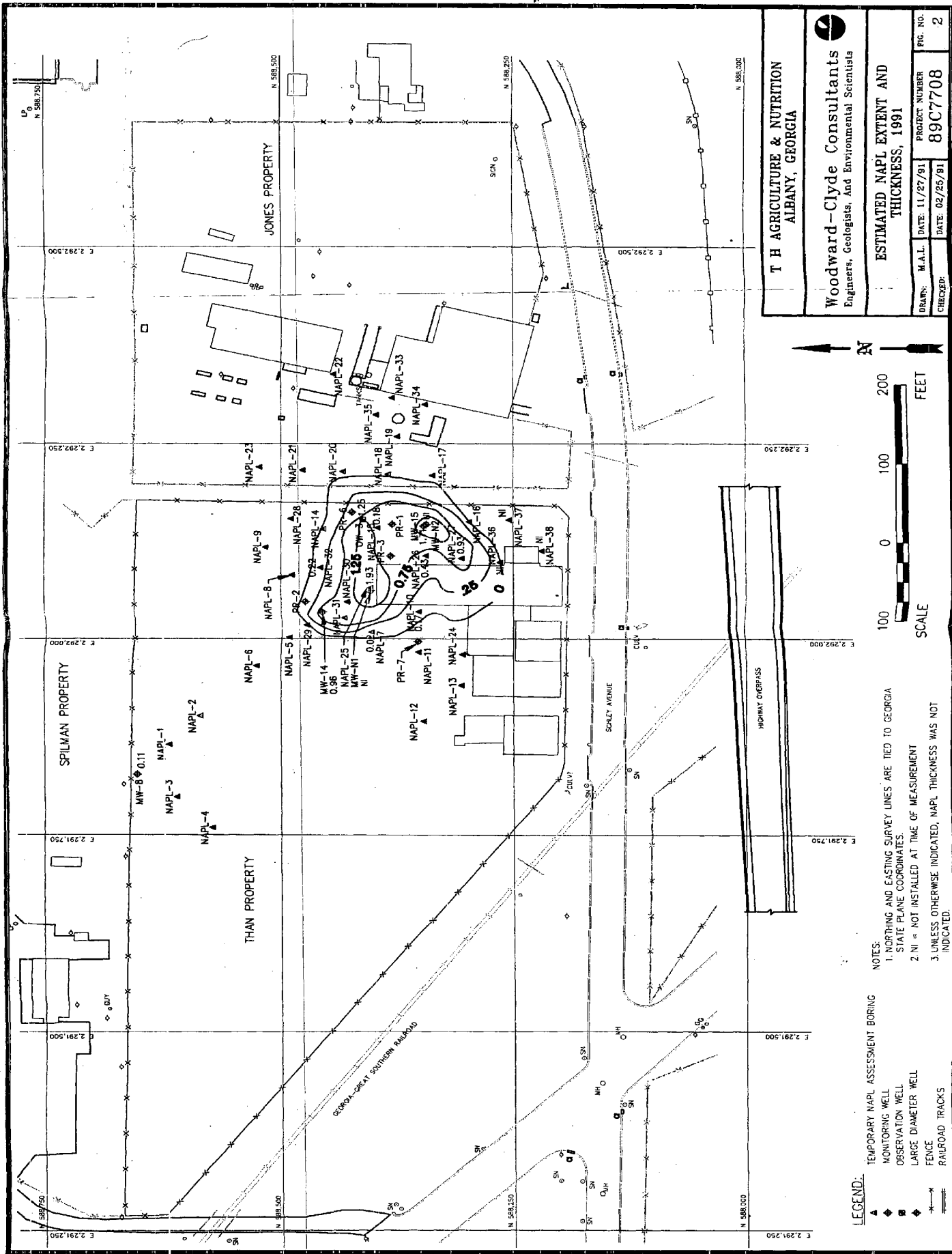
THAN conducted a treatability study consisting of four pilot tests from September to November 1994. The pilot tests were performed to evaluate the effectiveness of dual-phase extraction technology and three groundwater treatment options (carbon, ultraviolet oxidation, and air stripping), and to obtain operational parameters for design of a groundwater treatment system. The dual-phase vacuum extraction (DVE) pilot test evaluated whether DVE would be an effective means of extracting groundwater as well as extracting contaminants from the unsaturated zone soils. A long-term pilot study was conducted between August 1996 and October 1997. The removal rate for RAO compounds for the entire extraction system during the 14 months the DVE system operated was approximately 4.4 pounds per year.

The DVE pilot system was installed to remediate the source/LNAPL area. Estimates compiled by URS indicated that 26,000 pounds of RAO compounds were present in the source/LNAPL area. Even if the removal of RAO compounds achieved by the entire extraction system were attributed to the DVE wells, source remediation achieved with the DVE wells was negligible when compared to the estimated mass of contaminants in the source/LNAPL area.

The pilot-test DVE system was designed to extract contaminants from the area in the east-central portion of the THAN property in which the LNAPL had been observed. The estimated extent and thickness of LNAPL measured at the Site in 1991 is shown in Figure 2. The four DVE wells (PR-1, PR-2, PR-6, and PR-7) were installed across the LNAPL-bearing zone and extracted contamination near the interface of the saturated and unsaturated zones. This interface fluctuates from about 20 feet below ground surface (bgs) to 30 feet bgs in response to changes in groundwater levels. The pilot test was conducted to evaluate the potential removal of LNAPL. The DVE wells did not remove LNAPL as separate phase and the pilot test was ended in October 1997.

The groundwater extraction system consists of two extraction wells (EW-101 and EW-102) located on the Jones property, 80 to 100 feet east of the THAN property (Figure 3). The wells are screened to remove water from the upper 20 feet of the Ocala Limestone.

The major components of the groundwater treatment system include an LNAPL separator, a microfilter, and granular activated carbon (GAC). Treatability studies showed that microfiltration was necessary to remove contaminants absorbed to suspended solids. No LNAPL was observed after more than 2 years of operation. The LNAPL separator was bypassed in November 1998 in accordance with a work plan submitted to USEPA in February 1998.



T H AGRICULTURE & NUTRITION ALBANY, GEORGIA	
Woodward-Clyde Consultants Engineers, Geologists, And Environmental Scientists	
ESTIMATED NAPL EXTENT AND THICKNESS, 1991	
DATE: 11/27/91	PROJECT NUMBER: 89C7708
CHECKED: M.A.L.	FIG. NO. 2



The groundwater extraction system removes between 1 and 7 gallons per minute (gpm) with an average of approximately 1 gpm, and the water is then treated and discharged to the on-site infiltration wells at the Site. Approximately 3.5 million gallons of water have been extracted and treated by the system since 1996.

Groundwater sampling has been conducted at the Site to evaluate progress of the remedial action since the groundwater extraction and treatment system became operational in 1996. The results of this monitoring are summarized in Table 1 (Appendix A). This table presents results for those compounds which were assigned remedial action objectives in the ROD. These are referred to as the RAO compounds in this report, and include DDT, Toxaphene, a-BHC, b-BHC, Aldrin, Dieldrin, and EDE. This table includes a summary of sampling events for RAO compounds for the years 1994, 1998, and 2001 where the samples were collected from a well in these years.

Table 2 (Appendix A) presents construction details for the monitoring wells at the Site. Figure 4 shows the estimated area of attainment which was present in Site groundwater in 1995. The area of attainment is the area of groundwater where at least one of the RAO compounds is present above the RAO concentrations. Figure 5 shows the estimated area of attainment as of August, 2001.

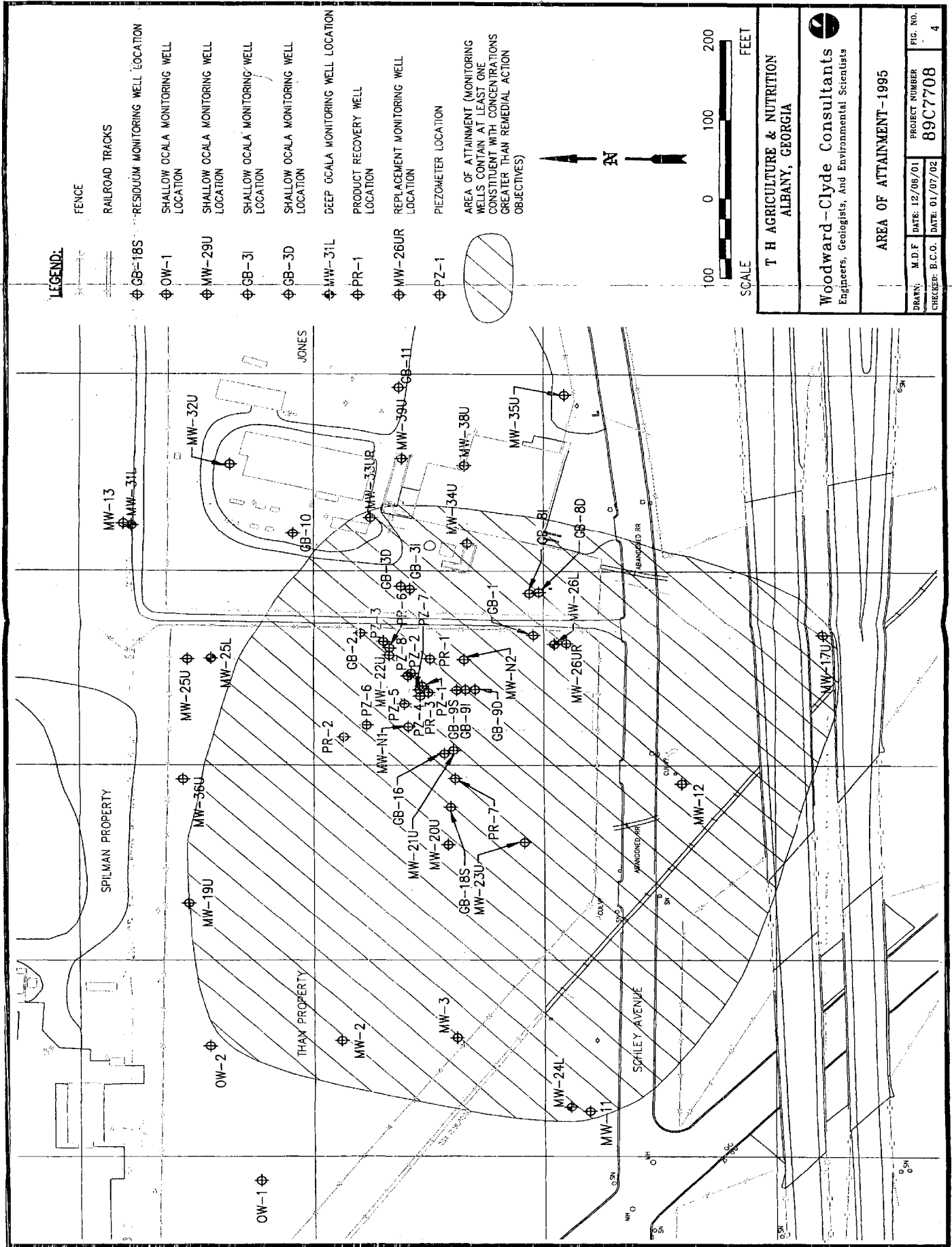
Figures 4 and 5 show that the area of attainment has not been reduced through pumping of an estimated 3.5 million gallons of groundwater since 1996. The plume size is essentially the same and the concentrations of compounds of concern are also largely unchanged within the plume. Appendix B of this report includes maps of the estimated extent of RAO compounds in groundwater during the remedial action.

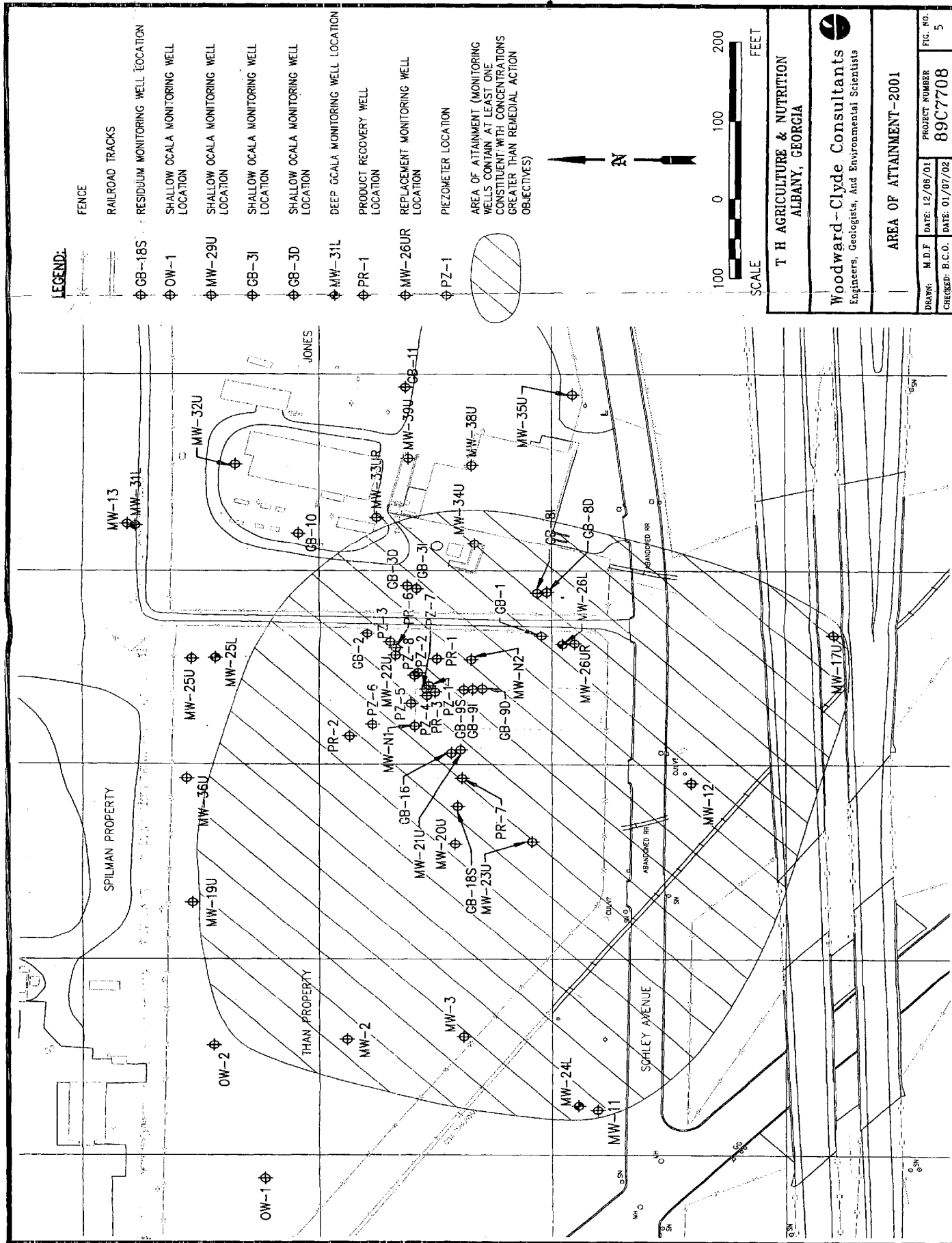
Based on the data presented in the above-mentioned tables, figures, and maps, the following conclusions about the status of groundwater can be made:

- No significant trend in contaminant concentrations is present and little change has occurred over the 5 years the groundwater extraction system has operated.
- The area of attainment, which represents the area where at least one RAO compound is detected above its associated cleanup level, is essentially unchanged after 5 years of pumping (see Figure 4 and Figure 5).
- All perimeter wells remain unimpacted by the compounds of concern above the RAO concentration.

The estimated cumulative mass of compounds of concern and the RAO compounds removed by the extraction system are shown in Appendix C, Graphs 1 and 2, respectively. The cumulative volume of groundwater removed by the extraction system is presented in Graph 3 (Appendix C).







An estimated 480 pounds of contaminants, 7 pounds of which are RAO compounds, have been removed from groundwater at the Site by the extraction system.

#### System Operations/O&M

An Operations and Maintenance Plan and Manual was developed by THAN in March 1997 (Woodward-Clyde, 1997). This manual included a description of system operating procedures, inspection and maintenance procedures, and the monitoring and sampling activities for the system.

The Operation & Maintenance cost for the extraction and treatment system is approximately \$200,000 annually. Removing one pore volume of groundwater from within the plume (33,000,000 gallons) is estimated to cost \$13.2 million dollars excluding the system installation cost. The lack of LNAPL removal by the extraction system indicates that the basis for selection of this remedy has not been successfully implemented and without treatment of the LNAPL, removal of any significant mass of RAO compounds may not be possible.

#### **V. Progress Since the Last Review**

This is the first Five-Year Review for the site.

#### **VI. Five-Year Review Process**

##### Community Notification and Involvement

Since the PRP was preparing the information for this five-year review, EPA decided not to notify the community until the data and the report were reviewed. The EPA will announce the completion of this report and allow the public to comment on it. Since much remediation has taken place on this site, community involvement has decrease with time.

##### Document Review

The following documents were reviewed for this report:

- USEPA, 1993. Record of Decision, Summary of Alternative Selection. TH Agriculture & Nutrition Site, Operable Unit One, Dougherty County, GA. U.S. Environmental protection Agency Region IV. May.
- USEPA, 1999. Groundwater Cleanup: Overview of Operating Experience at 28 Sites. Document Number 542-R-99-006. Solid Waste and Emergency Response. Washington, D.C. September.

- USEPA, 2001. Comprehensive Five-Year Review Guidance. Document Number 540-R-01-007. Office of Emergency and Remedial Response. Washington, D.C. June.
- Woodward-Clyde Consultants. 1992. Remedial Investigation Report, TH Agriculture & Nutrition Company, Inc. Albany, GA. February.
- Woodward-Clyde Consultants. 1992a. Feasibility Study Report, TH Agriculture & Nutrition Company, Inc. Albany, GA. June.
- Woodward-Clyde Consultants. 1995. Remedial Design, TH Agriculture & Nutrition Company, Inc. Albany, GA. September.
- Woodward-Clyde Consultants. 1997. Operations and Maintenance Plan and Manual, TH Agriculture & Nutrition Company, Inc. Albany, GA. March.

#### Data Review

Groundwater monitoring has been conducted at the Site to evaluate progress of the remedial action since the groundwater extraction and treatment system became operational in 1996. A portion of the results from the groundwater monitoring are summarized in Appendix A, Table 1. This table includes a summary of sampling events for RAO compounds for the years 1994, 1998, and 2001.

#### Site Inspection

Since this 5 Year Review primarily consists of a review of the groundwater data collected at the site since 1994, a site inspection for this groundwater remedy was not necessary.

#### Interviews

Formal interviews were not conducted with the community. The PRP's and the land owner were advised of the five-year review.

### **VII. Technical Assessment**

#### Question A – Is the remedy functioning as described in the decision documents?

After 5 years of operation, contaminant mass removal rates at the Site are low in comparison to removal rates at other sites. A USEPA study on groundwater cleanup at 28 sites (USEPA, 1999) found contaminant mass removal rates ranging from 0.0001 pounds per 1,000 gallons treated to approximately 3 pounds per 1,000 gallons of water extracted.

At the Site, approximately 480 pounds of contaminants have been removed in 3,500,000 gallons of water for a removal rate of 0.137 pounds of contaminant mass per 1,000 gallons. Pesticides constitute the majority of RAOs. Out of the 480 pounds of contaminants removed by the extraction system, only 7 pounds were RAO compounds, representing a mass removal rate of 0.002 pounds per 1,000 gallons of water for RAO compounds.

The estimated operation and maintenance cost for the 5 years exceeds \$1,000,000. This means that one pound of RAO compounds was removed by the current system at a cost of \$150,000. At the present rate, it will take approximately 63 years and cost an estimated \$13.2 million to remove the RAO compounds in one pore volume of groundwater from within the plume area. Removal of many pore volumes of groundwater will be required to reach the RAO concentrations for the Site. The inability of the system to effectively remove LNAPL has made it very inefficient and possibly warrants a change in the remedy.

In addition, removal of LNAPL through pumping was a key feature of the selected remedy. No LNAPL has been observed in wells at the Site since before 1996. Further, the extraction and treatment system has not produced any LNAPL in the LNAPL separator system in the entire time it operated.

Question B – Are the exposure assumptions, toxicity data, cleanup level, and RAOs used at the time of the remedy still valid?

As described previously in this report, the cleanup levels and RAOs for Site groundwater which were presented in the ROD may not be met through pumping of LNAPL or groundwater. The RAOs presented in the ROD were based on the successful removal of LNAPL from the product recovery wells (Figure 3). It is apparent that the source/LNAPL is adsorbed to the clayey residuum within the saturated zone and may not be removed by pumping. Based on the results of the 5 years of operation of the remedy, the RAOs for groundwater may not be met in a reasonable time frame or cost. Based on the Site conditions and results of 5 years of pumping, this site may warrant a change in the selected remedy. The exposure assumptions and the cleanup levels may have to be re-evaluated.

Question C – Has any other information come to light that could call into question the protectiveness of the remedy?

Although the remedy is proceeding slower than expected, no known risk to human health is present. If we can assume that the plume has not moved in more than 10 years of monitoring and no receptors are present, the risk posed by groundwater at the Site is minimal. Soil at OUI has been treated to acceptable levels and residual concentrations have been capped.

### Technical Assessment Summary

A thorough review of the groundwater sampling results for the five years of operating the treatment system identified the following findings:

- The groundwater plume appears to be the same size and in the same location as it was in 1995.
- Concentrations of compounds of concern in groundwater including volatile organic compounds (VOCs) and pesticides appear to be unchanged after five years of groundwater extraction.
- One criterion for implementation of the remedy was Light Non-Aqueous Phase Liquids (LNAPL) removal. LNAPL can not be efficiently removed from the clay residuum with the groundwater extraction system.

### **VIII. Issues**

Presented below is a summary of the major issues identified in the 5-year review described in this document. These issues were identified as those that significantly affect the performance of the remedy and are discussed throughout this report.

Table 3: Issues

<b>Issues</b>	<b>Affects Current Protectiveness (Y/N)</b>	<b>Affects Future Protectiveness (Y/N)</b>
LNAPL not removed by pumping	Y	Y
Mass removal is inefficient	Y	Y
Vertical migration unknown	Y	Y
Plume size has not changed	N	Y

### **IX. Recommendations and Follow-Up Actions**

Based on our review of the 5-year performance of the remedy, changes are warranted to more effectively address RAO compounds in groundwater at the Site. The proposed changes are described below:

- Complete a new source/LNAPL characterization program to identify and quantify the source area and collect data to support potential LNAPL/source treatment alternatives (currently underway).
- Conduct studies to assess the feasibility of source treatment at the Site to replace the currently selected remedy.
- Implement an in-situ source mitigation alternative (if technically implementable) that will provide a more efficient process to eliminate as much of the source of contaminants to groundwater as is reasonably possible.
- Discontinue operation, but not remove the existing extraction and treatment system.
- Continue annual groundwater sampling to verify that the plume has remained stable, and to monitor the effectiveness of the source mitigation measures. More deep wells may be required to make sure that contamination is not moving vertically.
- Different sampling techniques may have to be used to improve and insure data quality.
- Complete a 5-year review of the alternative in 2006 to assess progress of this alternative.

#### **X. Protectiveness Statement**

A protectiveness determination at THAN OU-1 cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions:

- An evaluation of the sampling techniques presently used by the PRP to insure data quality,
- An evaluation of the vertical migration of the contaminants. More deep wells may be needed at the site,
- and an evaluation of other remedial options, such as chemical oxidation.

It is expected that these actions will take approximately one year to complete, at which time a protectiveness determination will be made.

#### **XI. Next Review**

If the present remedy is kept, the next five-year review report is due on April 29, 2006. If the remedy is changed, a new due date for the five-year review will be five years after the new remedial construction is started.

## APPENDICES



# APPENDIX A

## TABLES

TABLE -1  
GROUNDWATER SAMPLING RESULTS SUMMARY  
CONTAMINANTS OF CONCERN  
T H AGRICULTURE & NUTRITION SITE  
ALBANY, GEORGIA

	EDB (ug/L)	Toxaphene (ug/L)	a-BHC (ug/L)	b-BHC (ug/L)	Aldrin (ug/L)	Dieldrin (ug/L)	DDT (ug/L)
RAO Concentration (ug/l)	0.05	3.0	4.1	5.1	0.54	0.57	27
MW-25L (6-94)	ND (10)	ND (10)	ND (0.1)	1.0	ND (0.1)	ND (0.2)	ND (0.20)
MW-25L (6-98)	ND (1.0)	ND (0.05)	ND (0.05)	0.36	ND (0.05)	ND (0.10)	ND (0.10)
MW-25L (8-01)	ND (1.0)	1.2 J	ND (0.50)	0.37	ND (0.050)	0.027 J	ND (0.050)
MW-34U (6-94)	1,200	ND (5)	0.17	ND (0.05)	ND (0.05)	ND (0.10)	ND (0.1)
MR-34U (6-98)	ND (17)	ND (4)	0.88	ND (0.10)	ND (0.10)	ND (0.20)	ND (0.20)
MW-34U (8-01)	600	36	0.39	0.75 COL	0.41 COL	0.61	0.31 COL
GB-1 (6-94)	75	ND (20)	0.62	ND (0.20)	ND (0.20)	ND (0.40)	1.9
GB-1 (6-98)	11	ND (10)	0.78	0.69	ND (0.25)	ND (0.50)	1.4
GB-1 (8-01)	ND (20)	450	3.8 J	ND (5)	ND (5)	ND (5)	63
GB-2 (6-95)	270J	14,000	140J	ND (200)	ND (200)	ND (400)	2,100
GB-2 (6-98)	ND (5000)	40,000	ND (500)	ND (500)	ND (500)	ND (1000)	6,300
GB-2 (8-01)	ND (400)	46,000	210 J	ND (500)	ND (500)	ND (500)	7,200

**Notes:**

Bolded concentrations are those which are above the RAO concentrations.

**TABLE -1**  
**GROUNDWATER SAMPLING RESULTS SUMMARY**  
**CONTAMINANTS OF CONCERN**  
**TH AGRICULTURE & NUTRITION SITE**  
**ALBANY, GEORGIA (CONTINUED)**

	EDB (ug/L)	Toxaphene (ug/L)	a-BHC (ug/L)	b-BHC (ug/L)	Aldrin (ug/L)	Dieldrin (ug/L)	DDT (ug/L)
RAO Concentration (ug/l)	0.05	3.0	4.1	5.1	0.54	0.57	27
GB-3I (6-95)	330 J	ND (100)	10	4.0	ND (1)	ND (2)	20
GB-3I (6-98)	ND (120)	ND (200)	5.7	ND (5)	ND (5)	ND (10)	16
GB-3I (8-01)	ND (4)	440	7.3	3.5 J	0.79 N	ND (5)	4.6 N
MW-23U (6-94)	ND (10)	ND (500)	31	76	ND (5)	ND (10)	ND (10)
MW-23U (6-98)	ND (1.0)	ND (100)	9.2	46	ND (2.5)	ND (5)	ND (5)
MW-23U (8-01)	ND (1.0)	ND (200)	14	61	ND (5)	3.1 J	ND (5)
MW-21U (6-95)	NA	NA	0.039 J	0.19	NA	NA	NA
MW-21U (8-97)	ND (620)	ND (24)	0.64	0.76	NA	ND (0.48)	ND (0.48)
MW-21U (8-01)	160 J	15	1.1 COL	1.3	ND (0.25)	ND (0.25)	ND (0.25)
MW-26UR (6-94)	ND (10)	ND (10)	ND (10)	1.0	ND (0.10)	ND (0.20)	ND (0.20)
MW-26UR (6-98)	1.5	ND (20)	0.60	7.9	ND (0.50)	ND (1.0)	ND (1.0)
MW-26UR (8-01)	0.71 J	10 J	0.22 J	7.4	0.16 J	1.0	ND (0.50)

**Notes:**

Bolded concentrations are those which are above the RAO concentrations.

**TABLE -1**  
**GROUNDWATER SAMPLING RESULTS SUMMARY**  
**CONTAMINANTS OF CONCERN**  
**TH AGRICULTURE & NUTRITION SITE**  
**ALBANY, GEORGIA (CONTINUED)**

RAO Concentration (ug/l)	EDB (ug/L)	Toxaphene (ug/L)	a-BHC (ug/L)	b-BHC (ug/L)	Aldrin (ug/L)	Dieldrin (ug/L)	DDT (ug/L)
	0.05	3.0	4.1	5.1	0.54	0.57	27
MW-22U (6-95)	<b>980 J</b>	ND (25)	<b>3.8</b>	1.9	ND (0.25)	ND (0.5)	0.26 J
MW-22U (6-98)	ND (1200)	ND (10)	3.1	1.6	ND (0.25)	ND (0.50)	ND (0.50)
MW-22U (8-01)	ND (1000)	ND (20)	3.2	0.64 COL	ND (0.50)	ND (0.50)	0.20 N
MW-2 (6-94)	ND (10)	ND (500)	ND (5.0)	<b>84</b>	ND (5.0)	ND (10)	ND (10)
MW-2 (6-98)	ND (1.0)	ND (200)	ND (5.0)	<b>43</b>	ND (5.0)	ND (10)	ND (10)
MW-2 (8-01)	ND (1.0)	ND (100)	ND (2.5)	<b>33</b>	ND (2.5)	ND (2.5)	ND (2.5)
MW-3 (8-97)	ND (1.0)	ND (96)	1.3	<b>14</b>	ND (0.96)	ND (1.9)	ND (1.9)
MW-3 (8-01)	ND (1.0)	ND (100)	2.5	<b>16</b>	ND (2.5)	ND (2.5)	ND (2.5)
MW-20U (6-94)	ND (10)	ND (120)	<b>13</b>	<b>15</b>	ND (1.2)	ND (2.5)	ND (2.5)
MW-20U (6-98)	ND (5.0)	ND (40)	<b>8.7</b>	<b>14</b>	ND (1.0)	ND (2.0)	ND (2.0)
MW-20U (8-01)	ND (4.0)	ND (200)	<b>7.8</b>	<b>16</b>	ND (5.0)	ND (5.0)	ND (5.0)

**Notes:**

Bolded concentrations are those which are above the RAO concentrations.

TABLE -1  
GROUNDWATER SAMPLING RESULTS SUMMARY  
CONTAMINANTS OF CONCERN  
T H AGRICULTURE & NUTRITION SITE  
ALBANY, GEORGIA (CONTINUED)

	EDB (ug/L)	Toxaphene (ug/L)	a-BHC (ug/L)	b-BHC (ug/L)	Aldrin (ug/L)	Dieldrin (ug/L)	DDT (ug/L)
RAO Concentration (ug/l)	0.05	3.0	4.1	5.1	0.54	0.57	27
MW-19U (6-94)	ND (10)	ND (250)	ND (2.5)	30	ND (2.5)	ND (5.0)	ND (5.0)
MW-19U (6-98)	ND (5.0)	ND (100)	ND (2.5)	24	ND (2.5)	ND (5.0)	ND (5.0)
MW-19U (8-01)	ND (6.2)	ND (100)	ND (2.5)	26	ND (2.5)	ND (2.5)	ND (2.5)
GB-8I (6-94)	ND (200)	ND (50)	1.2	3.1	ND (50)	ND (1.0)	ND (1.0)
GB-8I (6-98)	ND (25)	ND (100)	1.3	2.9	1.5	ND (2.0)	ND (2.0)
GB-8I (8-01)	2.1	410	41. J	5.1 COL	ND (5.0)	1.6 N	21
MW-17U (6-94)	ND (10)	ND (5.0)	0.031 J	0.80	ND (0.050)	0.61	ND (0.10)
MW-17U (6-98)	ND (1.0)	ND (2.0)	ND (0.050)	0.49	ND (0.050)	0.43	ND (0.10)
MW-17U (8-01)	ND (1.0)	4.7	ND (0.050)	0.39	ND (0.050)	0.36 COL	0.13 COL
MW-33UR (6-94)	47	ND (1000)	ND (10)	ND (10)	ND (10)	ND (20)	84
MW-33UR (6-98)	43	ND (100)	ND (2.5)	ND (2.5)	ND (2.5)	ND (5.0)	9.6
MW-33UR (7-99)	50	ND (40)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)

**Notes:**

Bolded concentrations are those which are above the RAO concentrations.

TABLE -1  
GROUNDWATER SAMPLING RESULTS SUMMARY  
CONTAMINANTS OF CONCERN  
T H AGRICULTURE & NUTRITION SITE  
ALBANY, GEORGIA (CONTINUED)

	EDB (ug/L)	Toxaphene (ug/L)	a-BHC (ug/L)	b-BHC (ug/L)	Aldrin (ug/L)	Dieldrin (ug/L)	DDT (ug/L)
RAO Concentration (ug/l)	0.05	3.0	4.1	5.1	0.54	0.57	27
MW-13 (6-94)	ND (10)	ND (5.0)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.1)	ND (0.1)
MW-13 (6-98)	ND (1.0)	ND (0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND (0.10)	ND (0.10)
MW-13 (8-01)	ND (1.0)	ND (2.0)	ND (0.05)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
MW-12 (6-94)	ND (10)	ND (100)	1.8	12	ND (1.0)	ND (2.0)	ND (2.0)
MW-12 (6-98)	ND (1.0)	ND (20)	0.66	8.6	ND (0.50)	1.5	1.1
MW-12 (8-01)	ND (1.0)	23	0.30 J	8.2	ND (0.50)	1.7	0.69 COL
MW-11 (6-94)	ND (10)	ND (100)	ND (1.0)	6.2	ND (1.0)	ND (2.0)	ND (2.0)
MW-11 (6-98)	ND (1.0)	ND (20)	ND (0.50)	5.4	ND (0.50)	ND (1.0)	ND (1.0)
MW-11 (8-01)	ND (1.0)	ND (20)	ND (0.50)	6.3	ND (0.50)	0.34 J	ND (0.50)
MW-28U (6-94)	ND (10)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-28U (9-98)	ND (1.0)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-28U (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)

**Notes:**  
Bolded concentrations are those which are above the RAO concentrations.

TABLE -1  
GROUNDWATER SAMPLING RESULTS SUMMARY  
CONTAMINANTS OF CONCERN  
T H AGRICULTURE & NUTRITION SITE  
ALBANY, GEORGIA (CONTINUED)

RAO Concentration (ug/l)	EDB (ug/L)	Toxaphene (ug/L)	a-BHC (ug/L)	b-BHC (ug/L)	Aldrin (ug/L)	Dieldrin (ug/L)	DDT (ug/L)
	0.05	3.0	4.1	5.1	0.54	0.57	27
MW-28L (6-94)	ND (10)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-28L (9-98)	ND (1.0)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-28L (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
MW-27U (6-94)	ND (10)	ND (5.0)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.10)	ND (0.10)
MW-27U (9-98)	ND (1.0)	ND (5.0)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.10)	ND (0.10)
MW-27U (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	0.020 J COL
MW-27L (6-94)	ND (10)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-27L (9-98)	ND (1.0)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-27L (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
MW-18U (6-94)	ND (10)	ND (10)	ND (0.1)	1.3	ND (0.10)	ND (0.20)	ND (0.2)
MW-18U (9-98)	ND (1.0)	ND (5)	ND (0.50)	0.29	ND (0.05)	ND (0.10)	ND (0.10)
MW-18U (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	0.26	ND (0.050)	ND (0.050)	ND (0.050)

**Notes:**  
Bolded concentrations are those which are above the RAO concentrations.

TABLE -1  
GROUNDWATER SAMPLING RESULTS SUMMARY  
CONTAMINANTS OF CONCERN  
T H AGRICULTURE & NUTRITION SITE  
ALBANY, GEORGIA (CONTINUED)

RAO Concentration (ug/l)	EDB (ug/L)	Toxaphene (ug/L)	a-BHC (ug/L)	b-BHC (ug/L)	Aldrin (ug/L)	Dieldrin (ug/L)	DDT (ug/L)
	0.05	3.0	4.1	5.1	0.54	0.57	27
MW-35U (6-94)	ND (10)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-35U (9-98)	ND (1.0)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-35U (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
MW-30U (6-94)	ND (10)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-30U (9-98)	ND (1.0)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-30U (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
MW-29U (6-94)	ND (10)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	0.13
MW-29U (9-98)	ND (1.0)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-29U (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)
MW-37U (6-94)	ND (10)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-37U (9-98)	ND (1.0)	ND (5.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.10)	ND (0.10)
MW-37U (8-01)	ND (1.0)	ND (2.0)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)

**Notes:**  
Bolded concentrations are those which are above the RAO concentrations.



**Table -2**  
**Monitoring Well Construction Details**  
**T H Agriculture & Nutrition Site**  
**Albany, Georgia**

WELL NUMBER	TOTAL WELL DEPTH (FT. BTOC)	TOTAL WELL DEPTH (FT. BGS)	DATE OF WELL COMPLETION	DATE ABANDONED	TOP OF CASING ELEV. (FT. MSL)	GROUND SURFACE ELEV. (FT. MSL)	SCREEN INTERVAL DEPTH (FT. BGS)	ELEV. TOP OF SCREEN (FT. MSL)	stickup
MW-01	52.64	51.5	2-01-83	9-93	214.54	213.40	32-52	181.4	1.1
MW-02	46.68	43.5	2-03-83	NA	204.08	200.90	24-44	176.9	3.2
MW-03	42.32	39.0	2-04-83	NA	202.92	199.60	19-39	180.6	3.3
MW-04	41.72	39.0	2-02-83	4-92	203.82	201.10	19-39	182.1	2.7
MW-06	48.88	46.0	1-20-84	4-92	208.68	205.80	26-46	179.8	2.9
MW-07	49.44	46.8	1-18-84	9-93	209.04	206.40	27-47	179.4	2.6
MW-08	49.93	47.0	1-19-84	9-93	212.23	209.30	27-47	182.3	2.9
MW-09	10.12	8.5	1-20-84	9-93	202.92	201.30	3.5-8.5	197.8	1.6
MW-10	10.55	8.5	1-20-84	4-92	202.65	200.60	3.5-8.5	197.1	2.1
MW-11	42.94	40.0	5-21-84	NA	203.94	201.00	20-40	181.0	2.9
MW-12	46.97	43.0	3-23-84	NA	206.87	202.90	23-43	179.9	4.0
MW-13	57.82	53.0	3-22-84	NA	218.72	213.90	33-53	180.9	4.8
MW-14	49.59	47.0	8-24-85	9-93	212.79	210.20	27-47	183.2	2.6
MW-15	44.31	43.5	8-23-85	9-93	209.91	209.10	23.5-43.5	185.6	0.8
MW-16	34.79	33.0	1-28-86	4-92	206.49	204.70	23-33	181.7	1.8
MW-17U	44.71	45.5	1-18-91	NA	200.31	201.10	35.5-45.5	165.6	-0.8
MW-18U	56.97	55.5	1-15-91	NA	213.47	212.00	43.5-53.5	168.5	1.5
MW-19U	56.58	54.0	1-08-91	NA	211.88	209.30	42-52	167.3	2.6
MW-20U	52.45	50.0	1-05-91	NA	206.15	203.70	38-48	165.7	2.5
MW-21U	54.99	52.0	1-09-91	NA	208.39	205.40	40-50	165.4	3.0
MW-22U	54.09	52.0	1-14-91	NA	214.26	212.17	40-50	172.2	2.1
MW-23U	52.54	50.0	1-15-91	NA	204.04	201.50	38-48	163.5	2.5
MW-24L	124.17	121.5	1-28-91	NA	203.27	200.60	109.5-119.5	91.1	2.7
MW-25U	58.85	57.0	1-08-91	NA	214.85	213.00	45-55	168.0	1.8
MW-25L	97.04	94.5	1-30-91	NA	215.54	213.00	82.5-92.5	130.5	2.5
MW-26U	48.84	47.0	1-05-91	6-94	207.14	205.30	35-45	170.3	1.8
MW-26UR	47.27	47.7	6-4-94	NA	205.88	206.31	37.5-47.5	168.8	-0.4
MW-26L	111.63	112.0	1-16-91	NA	205.83	206.20	100-110	106.2	-0.4
MW-27U	59.51	57	2-14-91	NA	220.41	217.90	45-55	172.9	2.51
MW-27L	142.23	140	2-13-91	NA	220.13	217.90	128-138	89.9	2.23
MW-28U	61.02	62	1-18-91	NA	217.42	218.40	50-60	168.4	-0.98
MW-28L	141.36	142	1-16-91	NA	217.86	218.50	130-140	88.5	-0.64
MW-29U	51.6	50	8-6-91	NA	214.40	212.80	40-50	172.8	1.6
MW-30U	52.69	50	8-6-91	NA	216.29	213.60	40-50	173.6	2.69
MW-31L	127.97	125	8-7-91	NA	217.27	214.30	115-125	99.3	2.97
MW-32U	44.81	45.0	8-6-91	?	208.91	209.10	35-45	174.1	-0.2
MW-33U	49.78	50.0	8-3-91	6-94	206.78	207.00	40-50	167.0	-0.2
MW-33UR	49.64	50.0	6-8-94	?	207.26	207.62	39.8-49.8	167.8	-0.4
MW-34U	44.86	45.0	8-7-91	5-99	206.56	206.70	35-45	171.7	-0.1
MW-34UR			8-99						
MW-35U	47.95	48.0	8-5-91	NA	207.85	207.90	38-48	169.9	-0.1
MW-36U	52.39	50.0	8-2-91	NA	215.89	213.50	40-50	173.5	2.4
MW-37U	44.96	45.0	8-7-91	NA	199.96	200.00	35-45	165.0	0.0

**Table -2**  
**Monitoring Well Construction Details**  
**T H Agriculture & Nutrition Site**  
**Albany, Georgia**

WELL NUMBER	TOTAL WELL DEPTH (FT. BTOC)	TOTAL WELL DEPTH (FT. BGS)	DATE OF WELL COMPLETION	DATE ABANDONED	TOP OF CASING ELEV. (FT. MSL)	GROUND SURFACE ELEV. (FT. MSL)	SCREEN INTERVAL DEPTH (FT. BGS)	ELEV. TOP OF SCREEN (FT. MSL)	stickup
MW-38U	44.94	45.2	6-8-94	NA	209.18	209.44	35-45	174.4	-0.3
MW-39U	44.69	45.2	6-7-94	5-99	207.67	208.18	35-45	173.2	-0.5
MW-N1	38.73	37.0	2-05-91	NA	211.93	210.20	10-35	200.2	1.7
MW-N2	38.66	37.0	2-05-91	NA	210.66	209.00	10-35	199.0	1.7
OW-01	34.21	32.0	2-11-83	NA	208.31	206.10	22-32	184.1	2.2
OW-02	34.31	32.0	2-10-83	NA	206.81	204.50	22-32	182.5	2.3
OW-03	38.09	37.0	2-11-83	NA	212.49	211.40	27-37	184.4	1.1
P-7	50	50.0	8-7-91	4-92	205.56	202.60	40-50	162.6	
GB-01	30.66	31.0	6-21-86	NA	206.20	206.54	26-31	180.5	-0.3
GB-02	36.76	37.0	6-23-86	NA	212.43	212.67	32-37	180.7	-0.2
GB-03S	20.56	21.0	2-13-87	9-93	207.36	207.80	15-20	192.8	-0.4
GB-03I	30.69	31.0	6-21-86	NA	207.59	207.90	26-31	181.9	-0.3
GB-03D	59.67	60.0	2-13-87	NA	207.57	207.90	55-60	152.9	-0.3
GB-07	30.46	28.0	6-23-86	4-92	205.09	202.63	22.5-27.5	180.1	2.5
GB-08S	-0.17	NA	2-12-87	9-93	206.53	206.70	12.5-17.5	194.2	-0.2
GB-08I	29.67	30.0	2-13-87	NA	206.27	206.60	25-30	181.6	-0.3
GB-08D	59.98	60.0	2-12-87	NA	206.58	206.60	55-60	151.6	0.0
GB-09S	19.52	20.0	2-20-87	NA	208.75	209.23	15-20	194.2	-0.5
GB-09I	34.69	35.0	2-20-87	NA	208.59	208.90	30-35	178.9	-0.3
GB-09D	65.68	66.0	2-19-87	NA	208.26	208.58	60-65	148.6	-0.3
GB-10	36.79	37.0	2-23-87	NA	208.19	208.40	32.5-37.5	175.9	-0.2
GB-11	35.67	36.0	2-21-87	NA	208.17	208.50	30-35	178.5	-0.3
GB-13	-0.1	NA	2-25-87	6-94	208.60	208.70	39-44	169.7	-0.1
GB-15	39.34	37.0	2-26-87	NA	210.84	208.50	33-38	175.5	2.3
GB-16	35.81	34.0	2-26-87	NA	207.51	205.70	28.5-33.5	177.2	1.8
GB-18S	2.95	NA	2-27-87	NA	206.35	203.40	12-17	191.4	2.9
GB-18I	35.13	32.5	2-27-87	4-92	206.03	203.40	27-32	176.4	2.6
PR-01	32.03	32.5	1-10-88	NA	209.89	210.36	13.3-33	197.1	-0.5
PR-02	37.13	37.5	1-12-88	NA	210.72	211.09	17.9-37.7	193.2	-0.4
PR-03	34.62	35.0	1-11-88	NA	209.67	210.05	14.7-34.5	195.4	-0.4
PR-06	39.3	38.0	1-12-88	NA	213.68	212.38	18.3-38	194.1	1.3
PR-07	29.1	28.0	1-12-88	NA	204.90	203.80	9-28.8	194.8	1.1
PZ-1	37.43	37.7	6-5-94	NA	210.18	210.45	32.5-37.5	178.0	-0.3
PZ-2	37.27	37.7	6-5-94	NA	210.76	211.19	32.5-37.5	178.7	-0.4
PZ-3	37.35	37.7	6-7-94	NA	212.20	212.55	32.5-37.5	180.1	-0.4
PZ-4	39.89	40.2	6-3-94	NA	210.16	210.47	35.0-40.0	175.5	-0.3
PZ-5	39.82	40.2	6-3-94	NA	210.54	210.92	35.0-40.0	175.9	-0.4
PZ-6	39.89	40.2	6-3-94	NA	211.00	211.31	35.0-40.0	176.3	-0.3
PZ-7	24.86	25.2	6-5-94	NA	210.16	210.50	20.0-25.0	190.5	-0.3
PZ-8	24.98	25.2	6-5-94	NA	210.97	211.19	20.0-25.0	191.2	-0.2

**Table -2**  
**Monitoring Well Construction Details**  
**T H Agriculture & Nutrition Site**  
**Albany, Georgia**

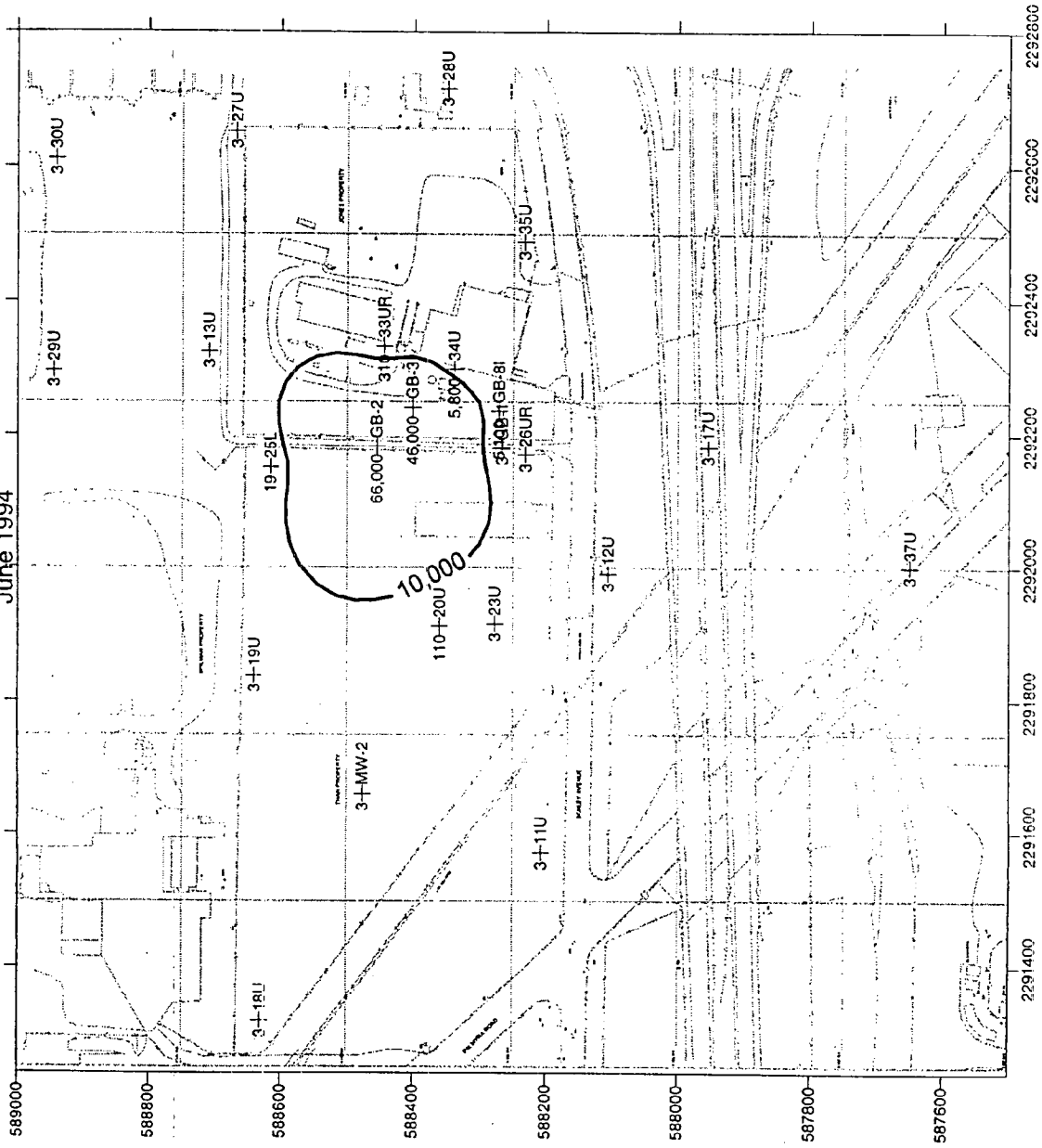
WELL NUMBER	TOTAL WELL DEPTH (FT. BTOC)	TOTAL WELL DEPTH (FT. BGS)	DATE OF WELL COMPLETION	DATE ABANDONED	TOP OF CASING ELEV. (FT. MSL)	GROUND SURFACE ELEV. (FT. MSL)	SCREEN INTERVAL DEPTH (FT. BGS)	ELEV. TOP OF SCREEN (FT. MSL)	stickup
PZ-9		48.9	1-15-96	NA		206.90	21.0-48.5	185.9	-206.9
PZ-10		48.9	1-17-96	NA		204.90	21.0-48.5	183.9	-204.9
EW-101		51.0	1-16-96	NA		206.89	21.0-49.0	185.9	-206.9
EW-102		51.0	1-18-96	NA		204.90	21.0-49.0	183.9	-204.9
IW-101		52.1	1-9-96	NA		197.88	22.1-51.7	175.8	-197.9
IW-102		51.5	1-10-96	NA		198.30	21.5-51.1	176.8	-198.3
IW-103		51.0	1-11-96	NA		199.40	21.0-50.6	178.4	-199.4
IW-104		51.0	1-12-96	NA		200.38	21.0-50.6	179.4	-200.4
IW-105		50.2	1-13-96	NA		201.81	20.2-49.8	181.6	-201.8

NOTES:

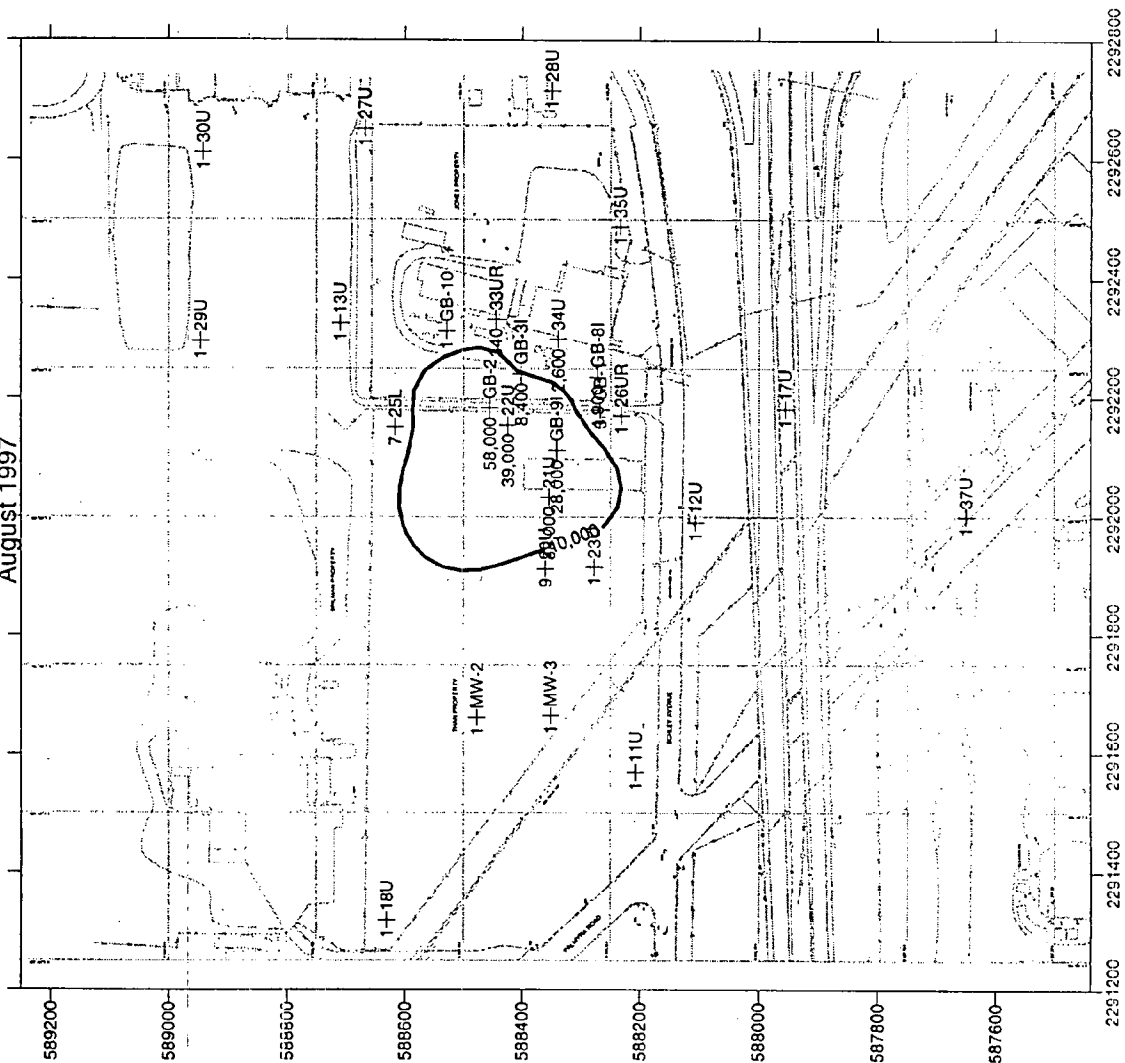
NA = NOT APPLICABLE  
NE = NOT ENCOUNTERED  
NL = NOT LOGGED

FT. BGS = FEET BELOW GROUND SURFACE  
FT. MSL = FEET ABOVE MEAN SEA LEVEL (1983)

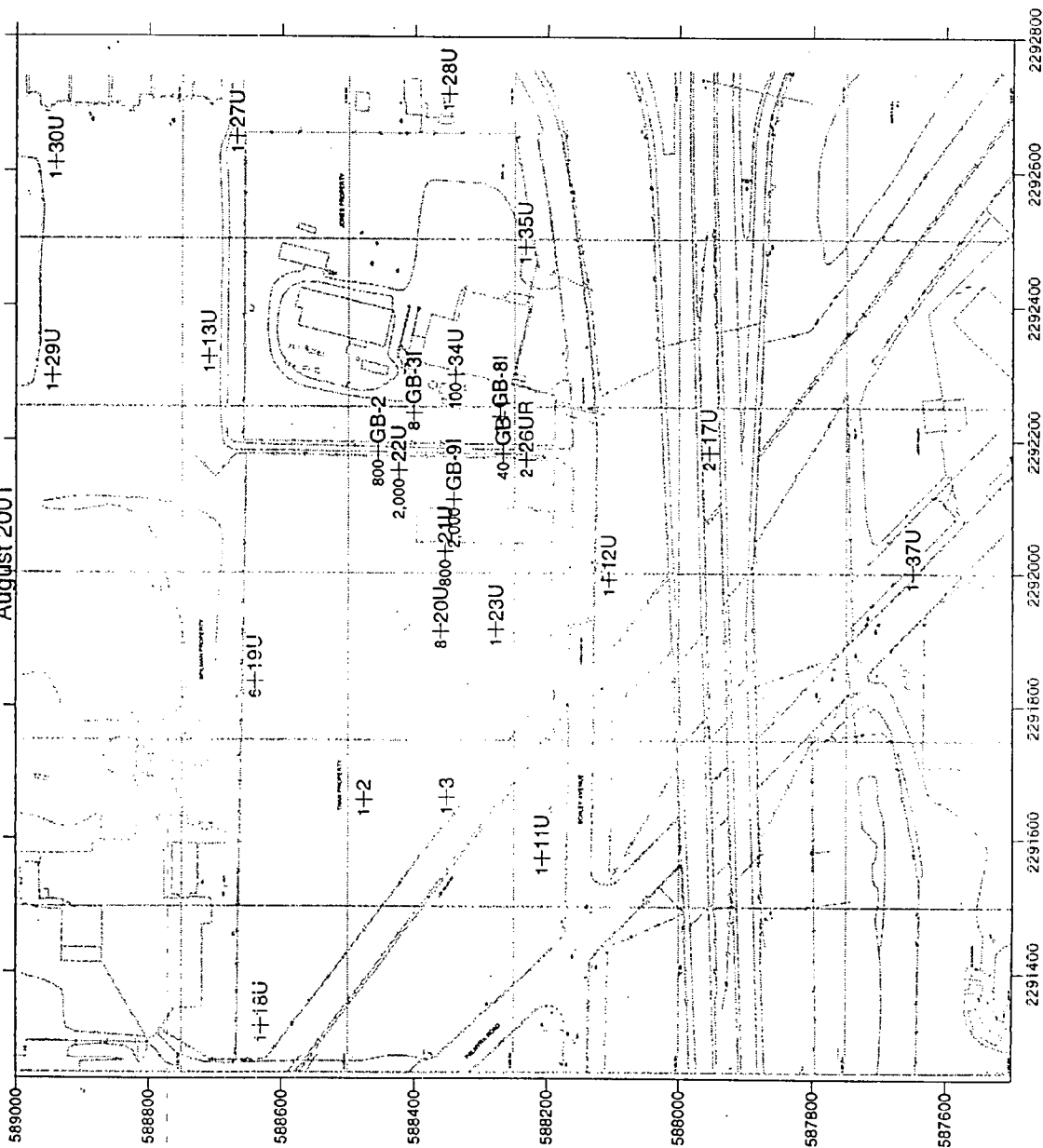
# Xylenes, Total (µg/L) June 1994



Xylenes, Total (µg/L)  
August 1997



# Xylenes, Total (µg/L) August 2001





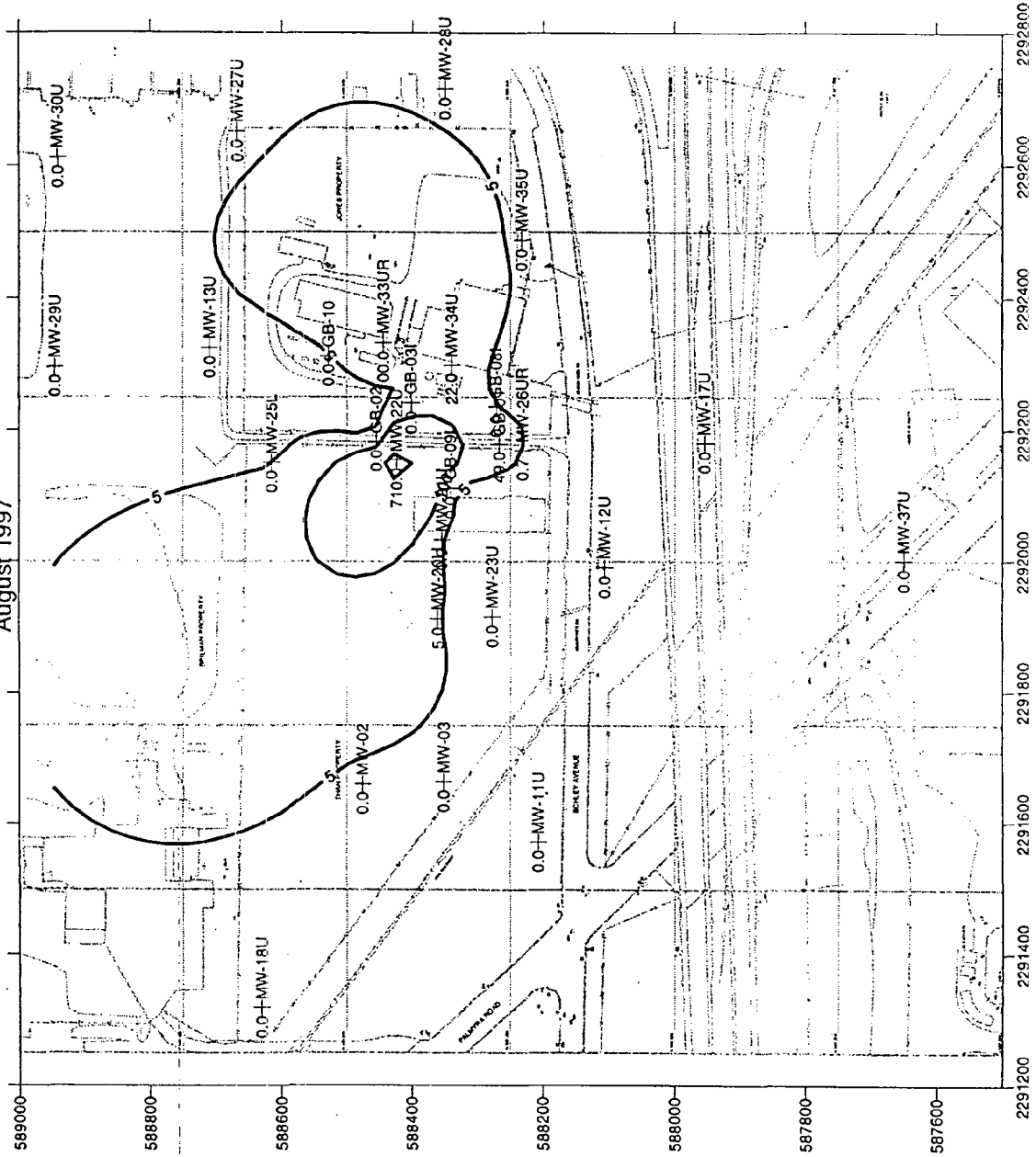






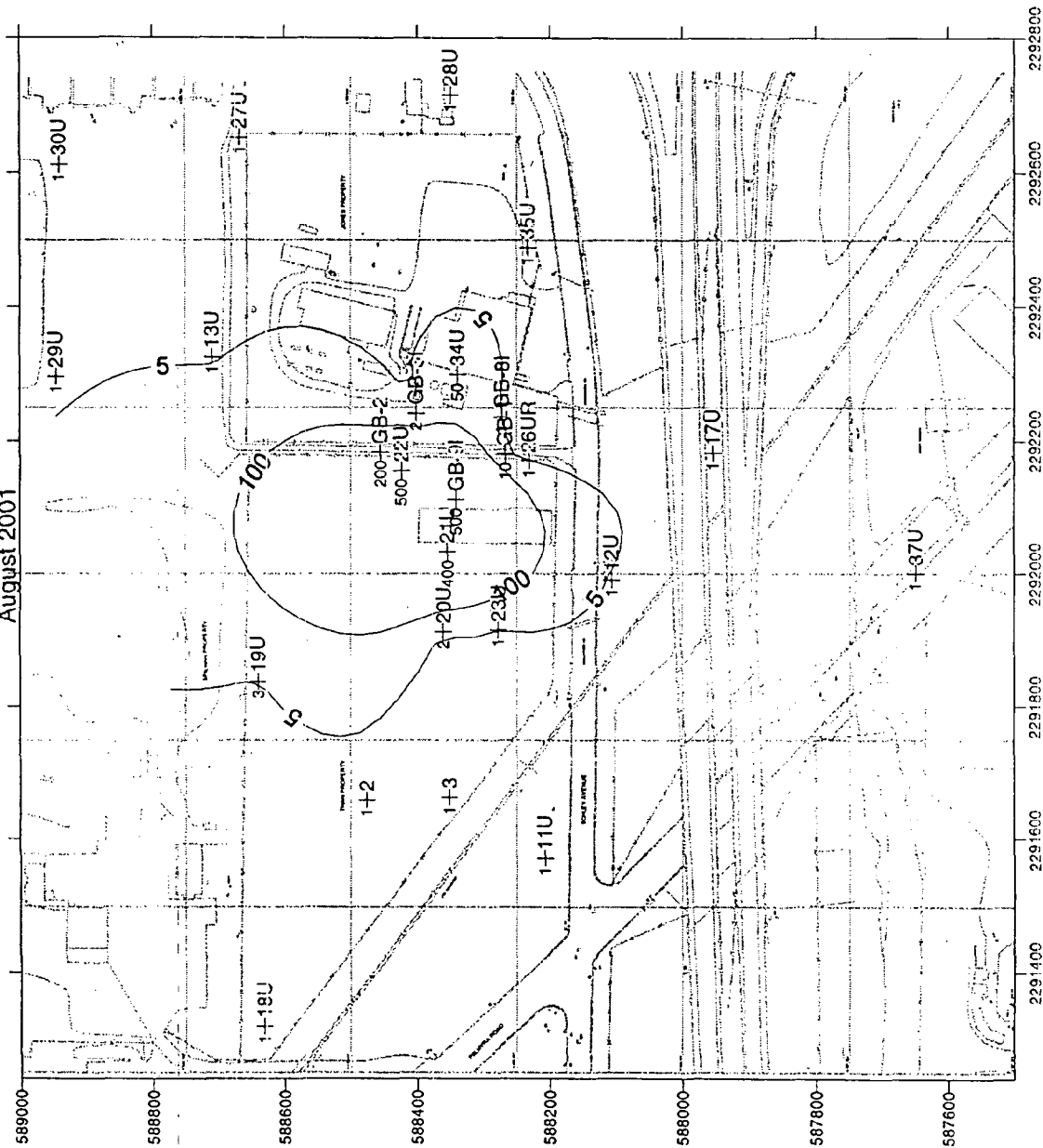
[illegible]

1,2-Dibromoethane (EDB) (µg/L)  
August 1997



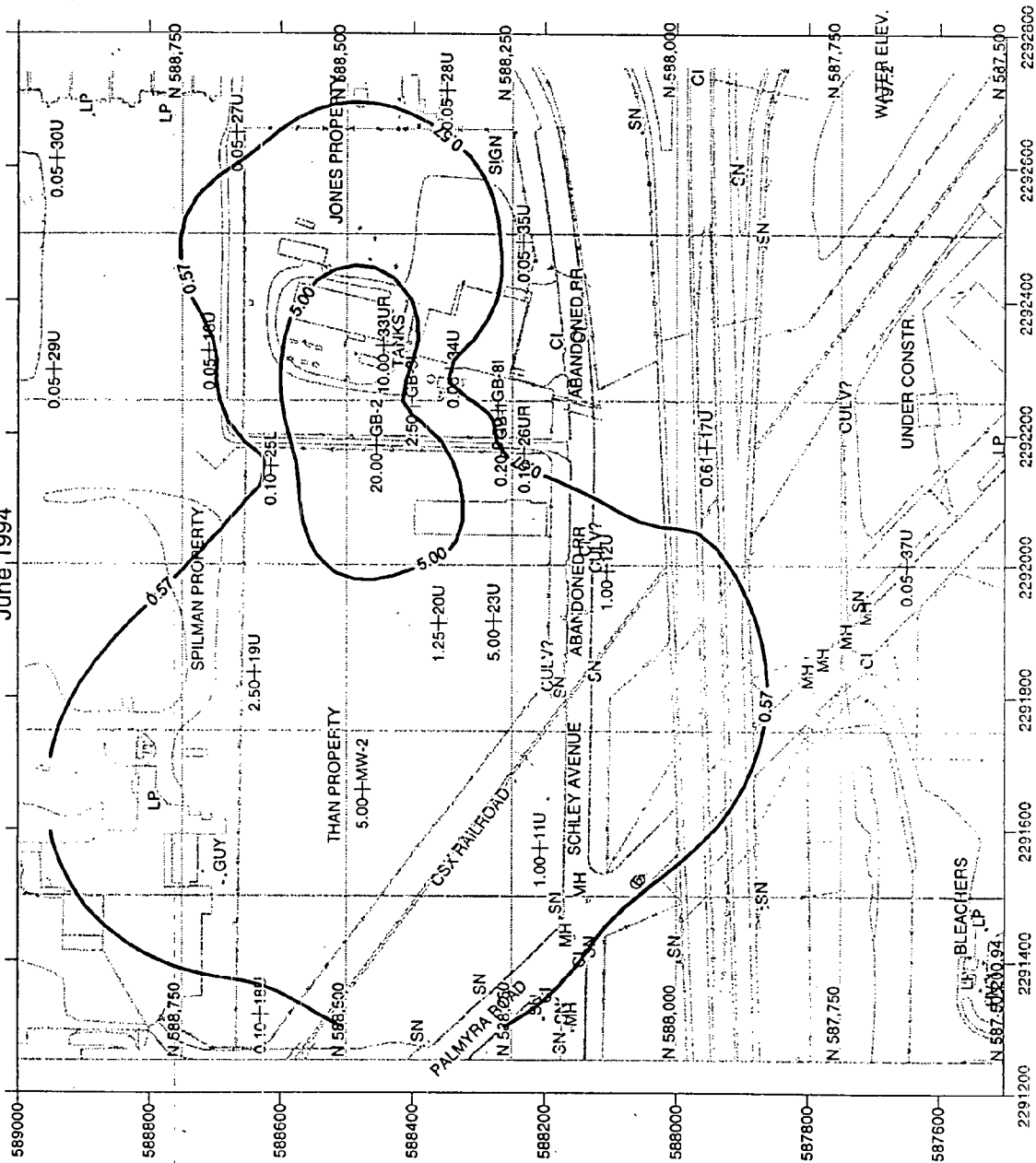
# 1,2-Dibromoethane (EDB) (µg/L)

August 2001

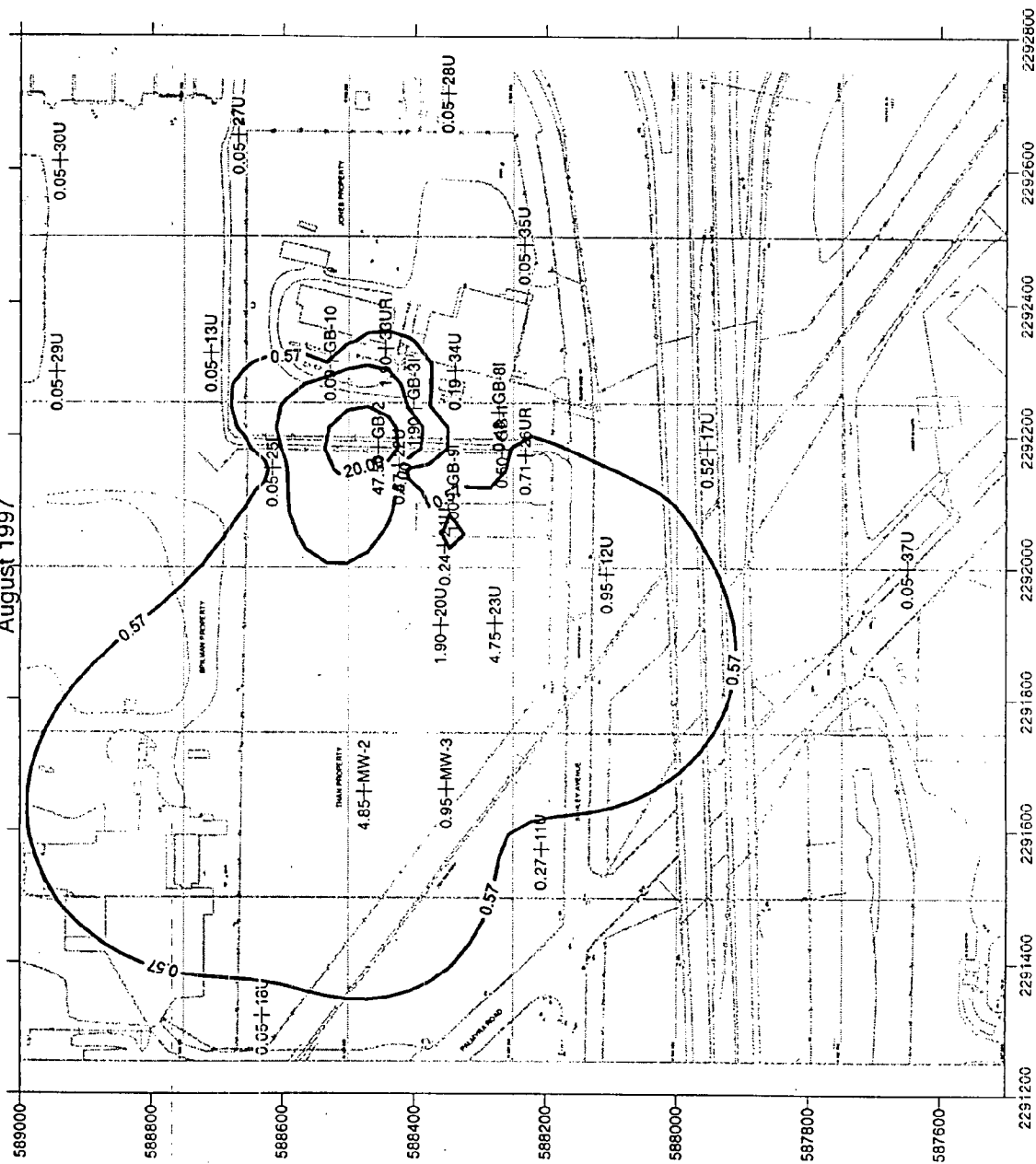




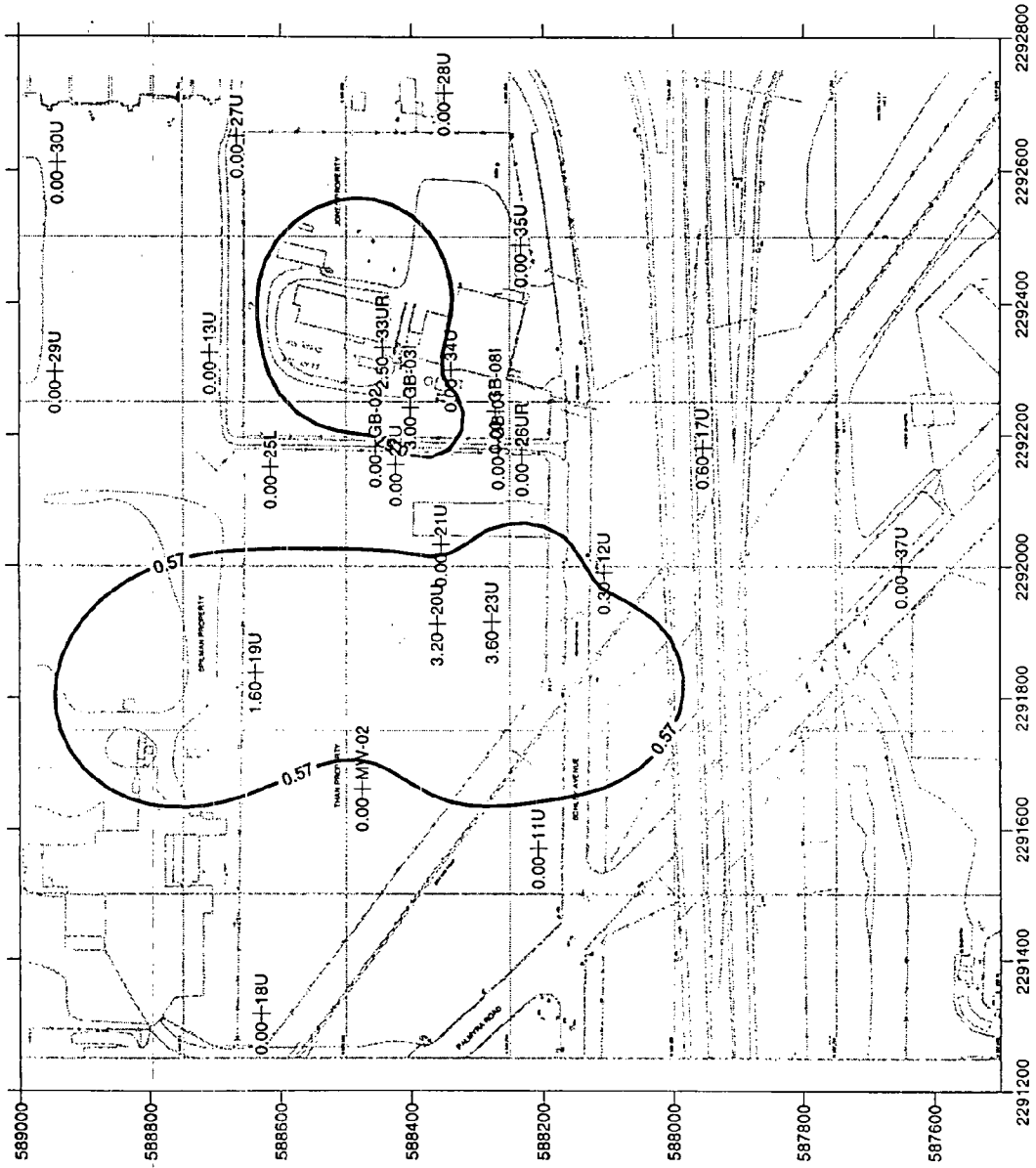
Dieldrin (µg/L)  
June, 1994



# Dieldrin (µg/L) August 1997

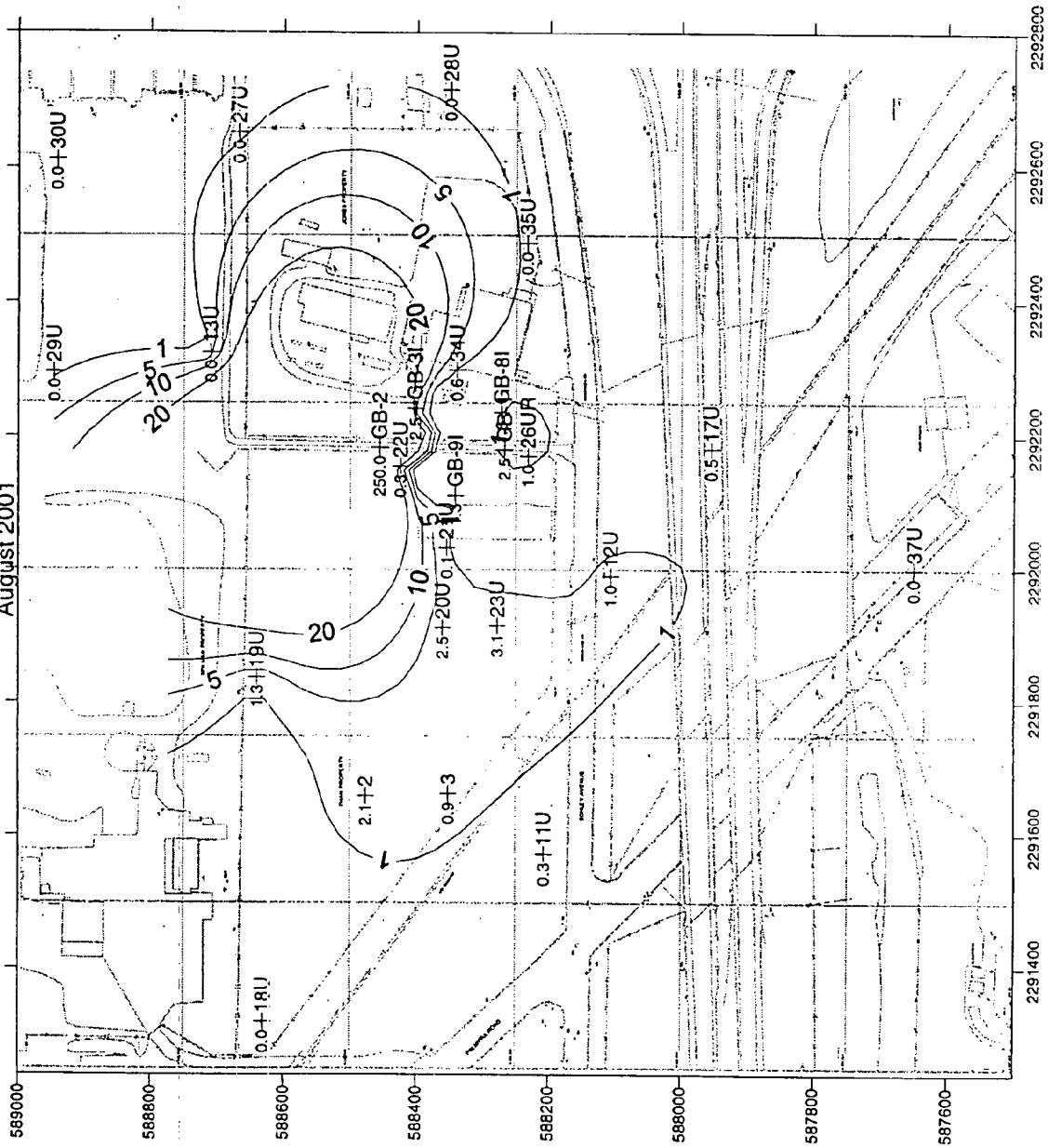


Dieldrin ( $\mu\text{g/L}$ )  
July 1999

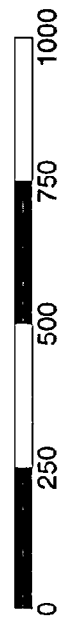




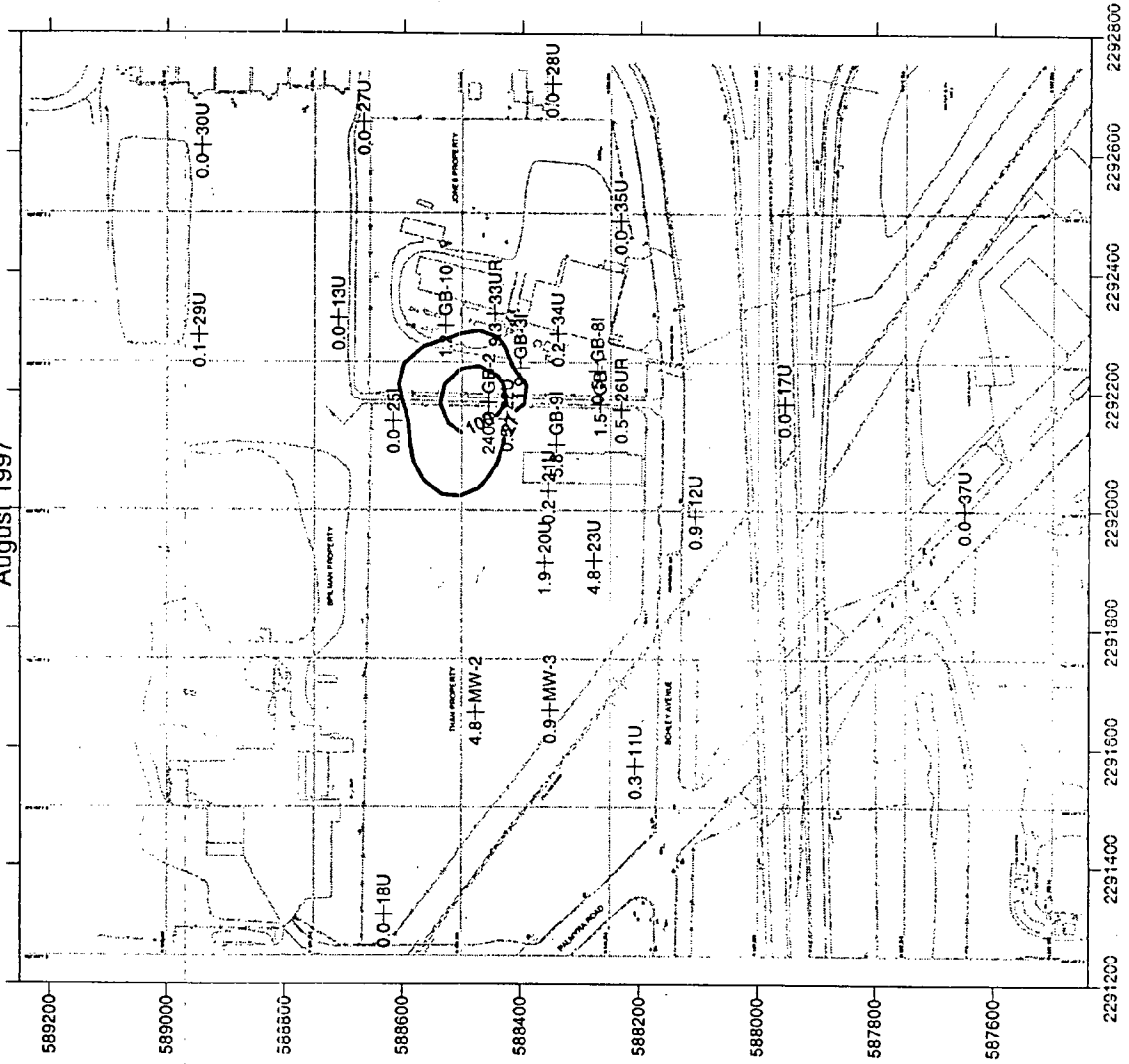
# Dieldrin (µg/L) August 2001



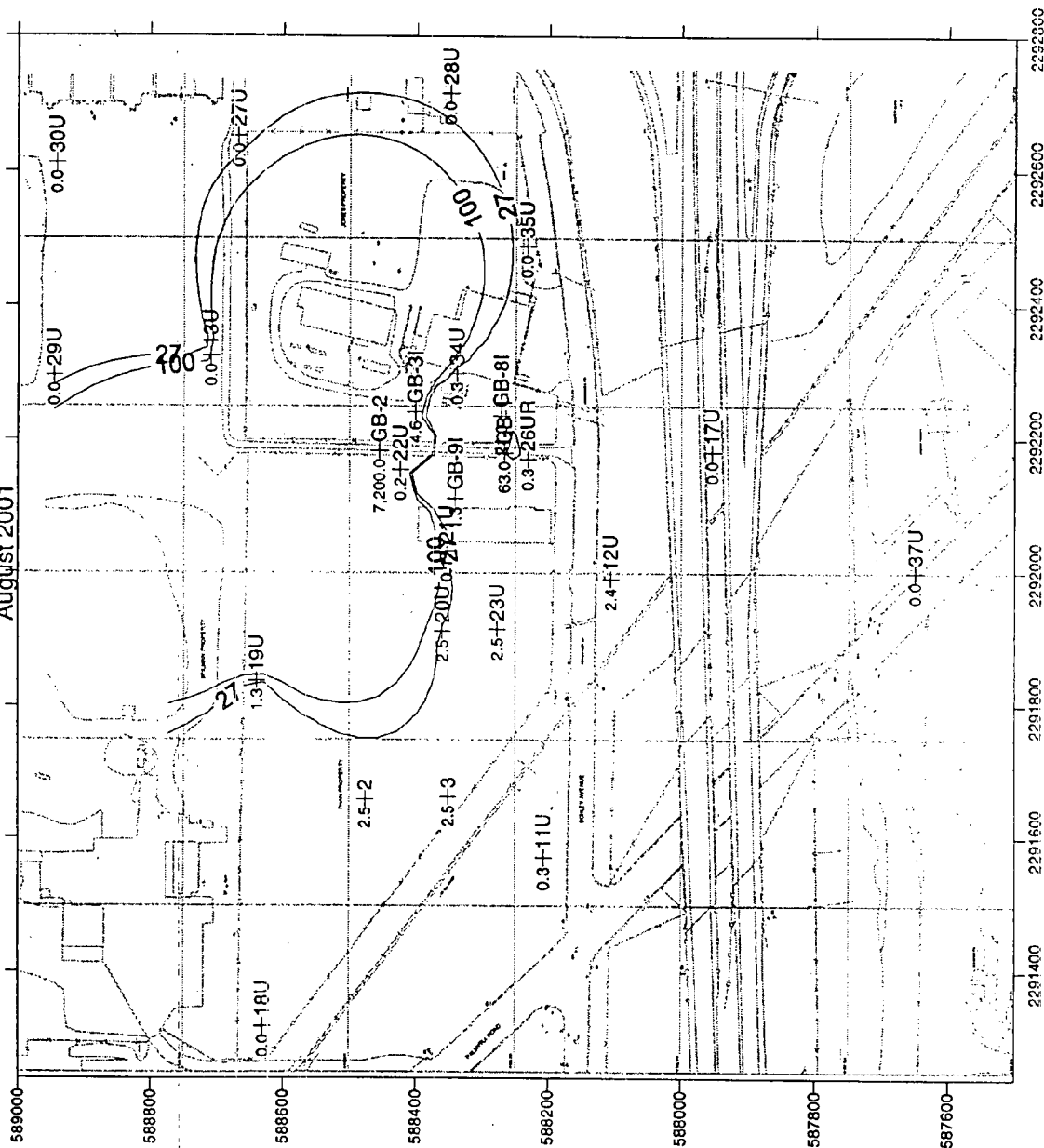




4,4'-DDT ( $\mu\text{g/L}$ )  
August 1997

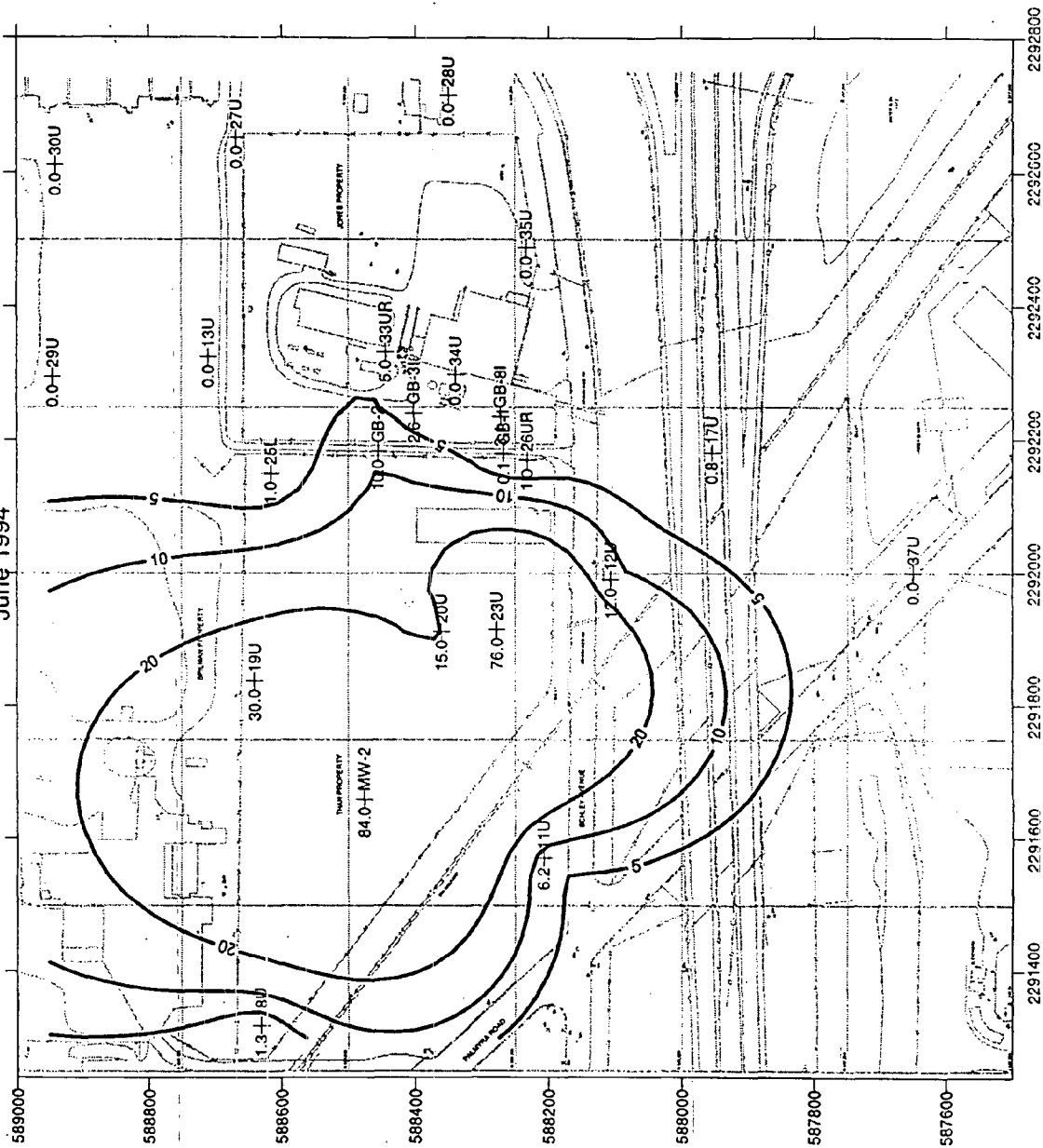


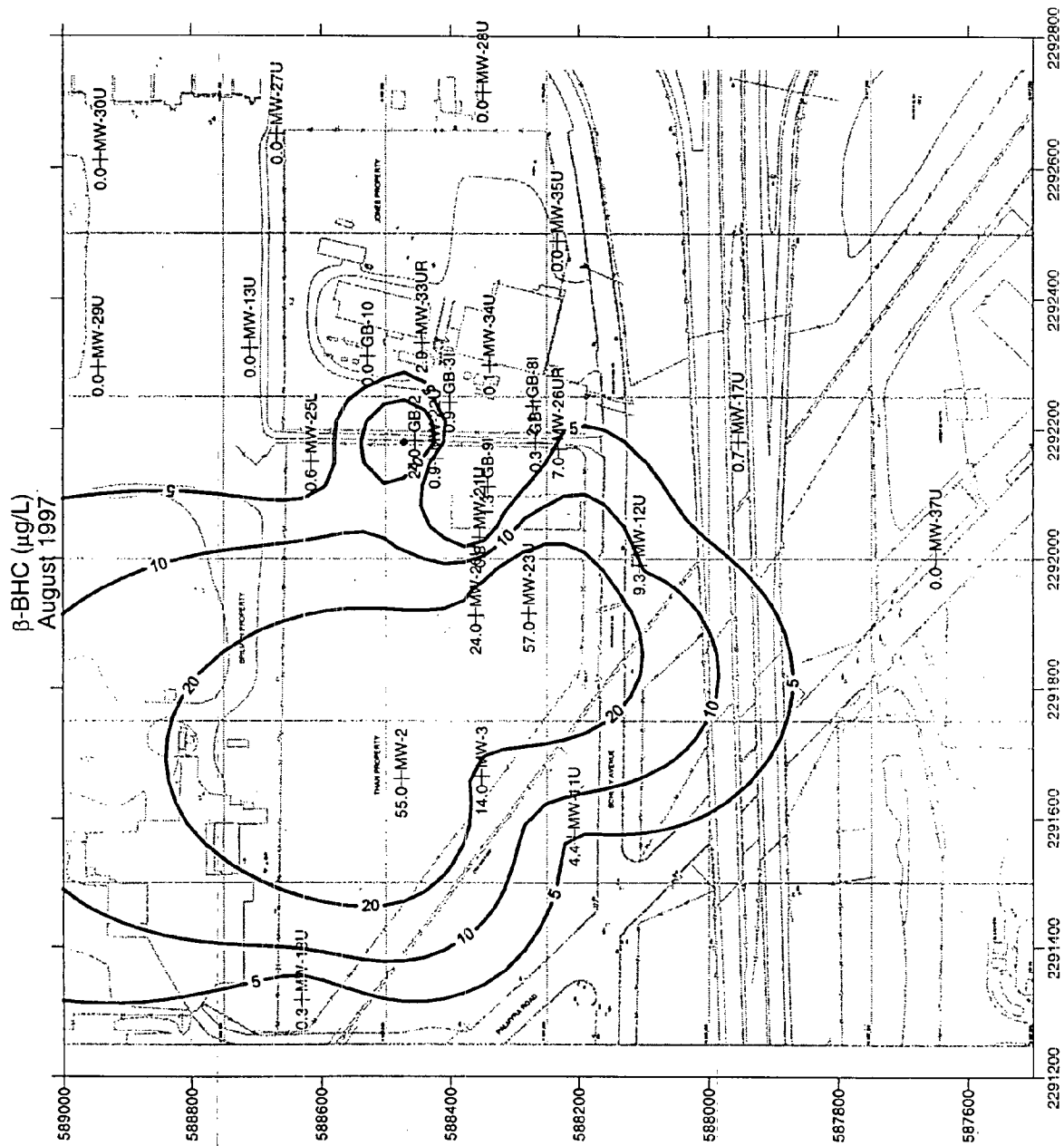
4,4'-DDT ( $\mu\text{g/L}$ )  
August 2001





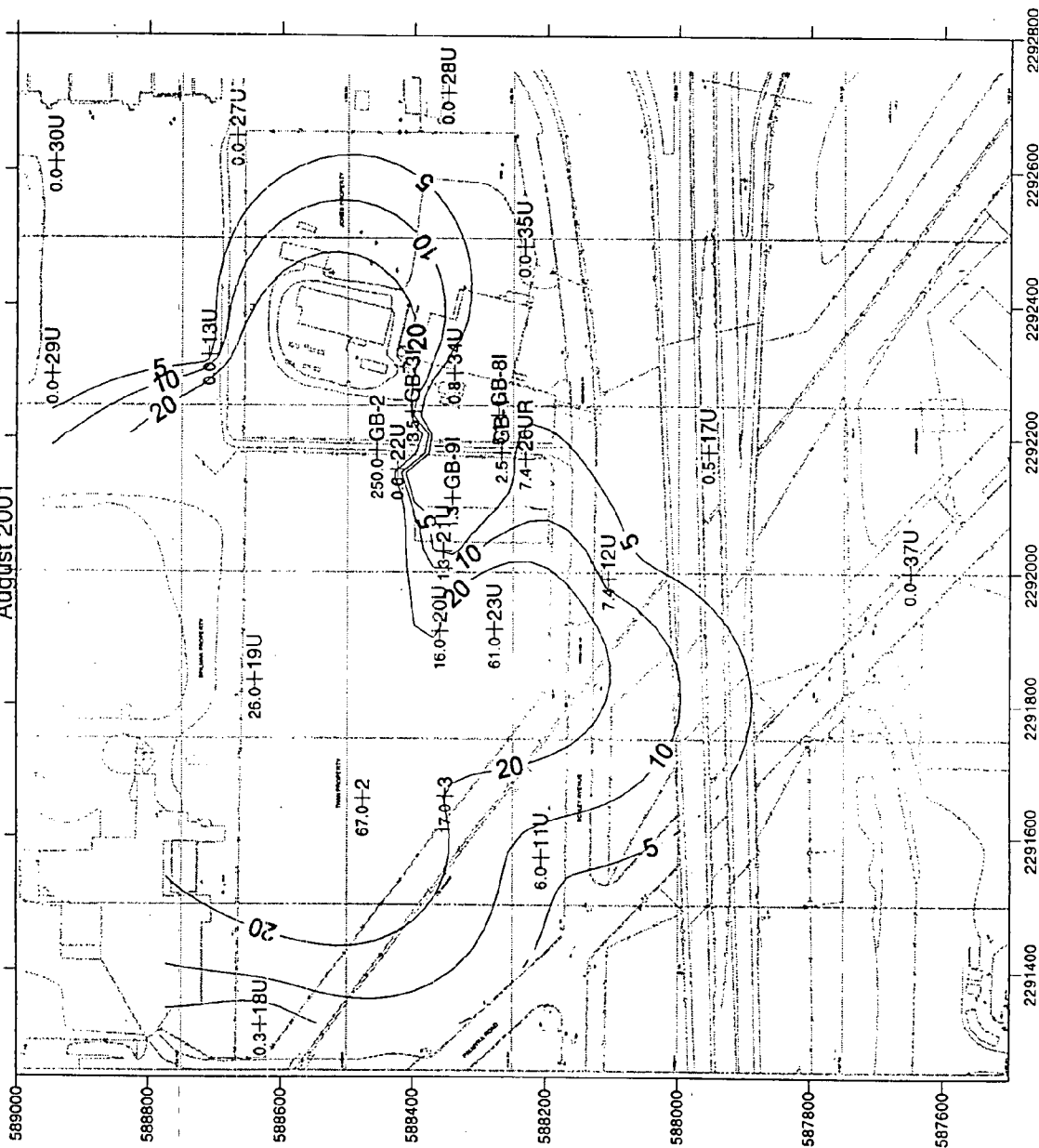
$\beta$ -BHC ( $\mu\text{g/L}$ )  
June 1994



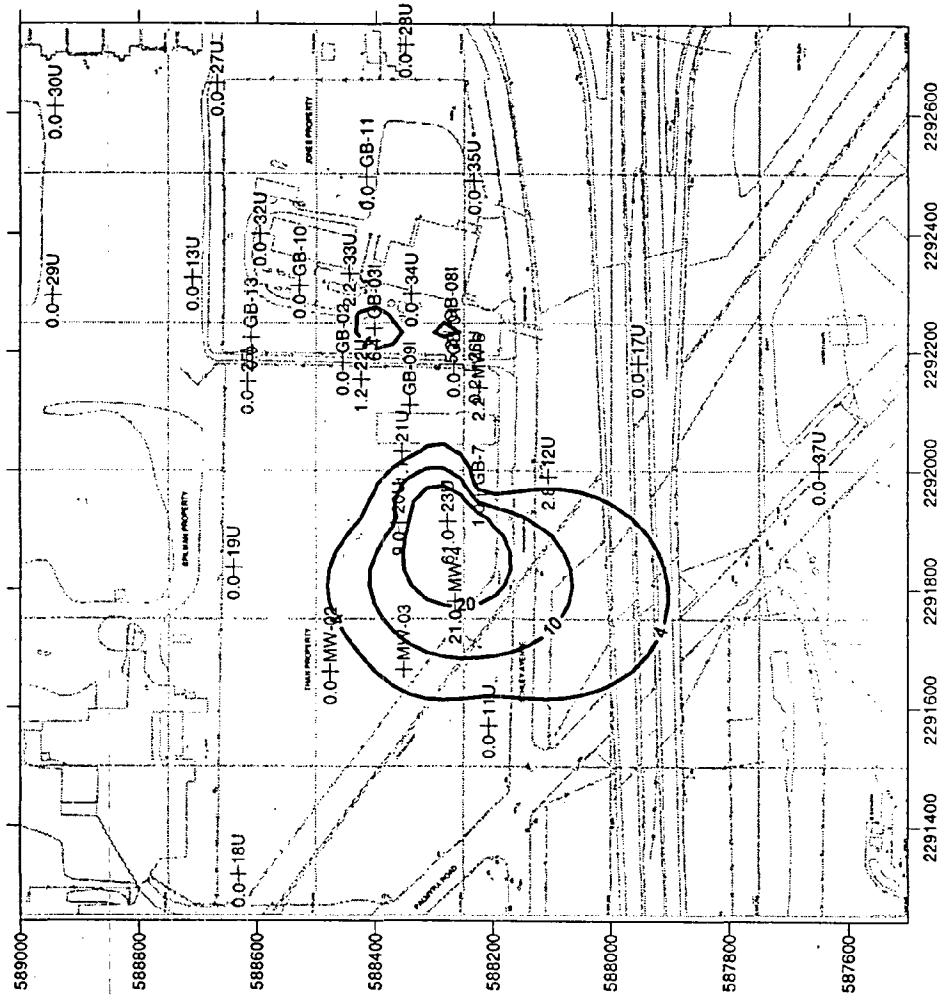




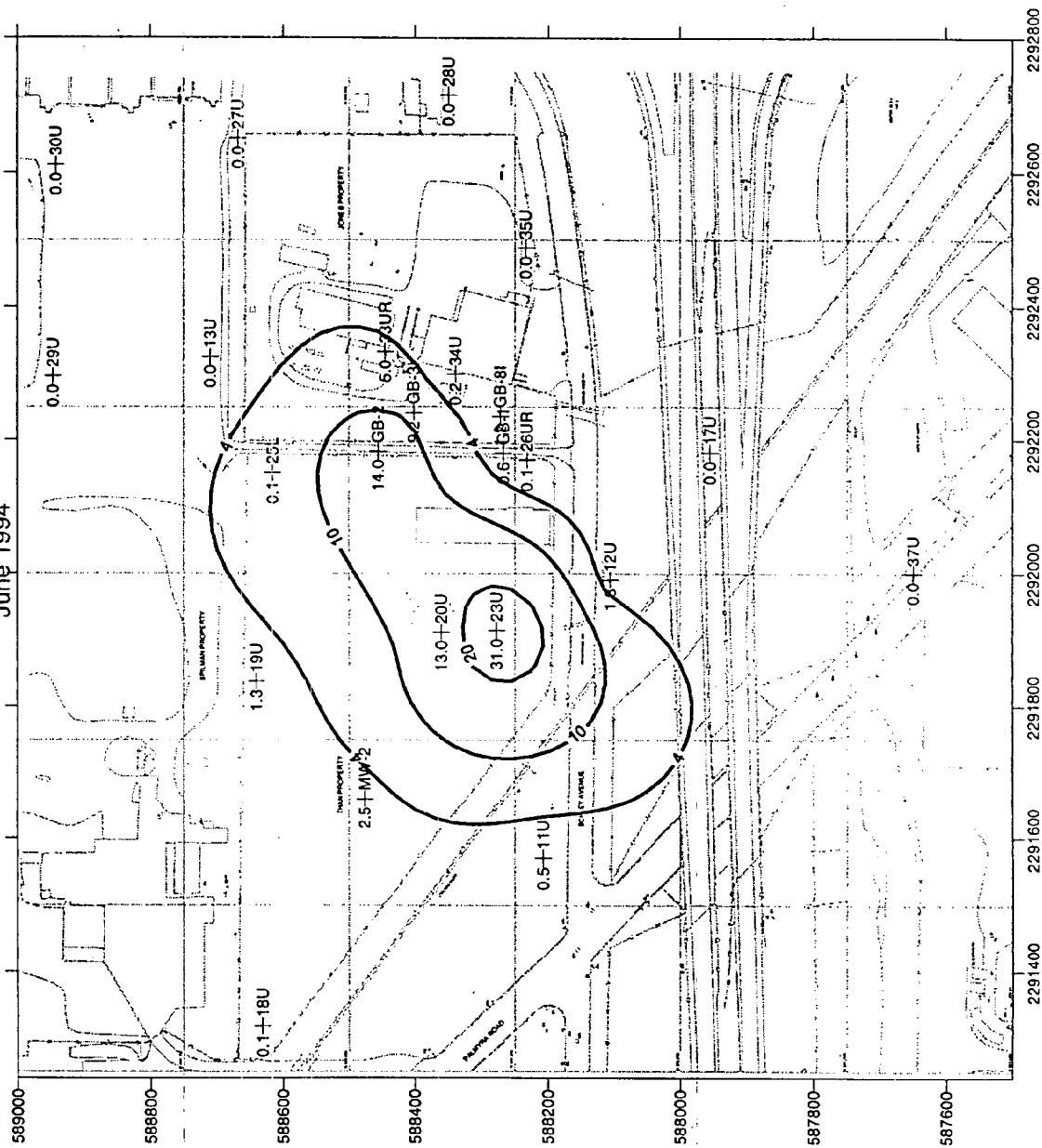
$\beta$ -BHC ( $\mu\text{g/L}$ )  
August 2001



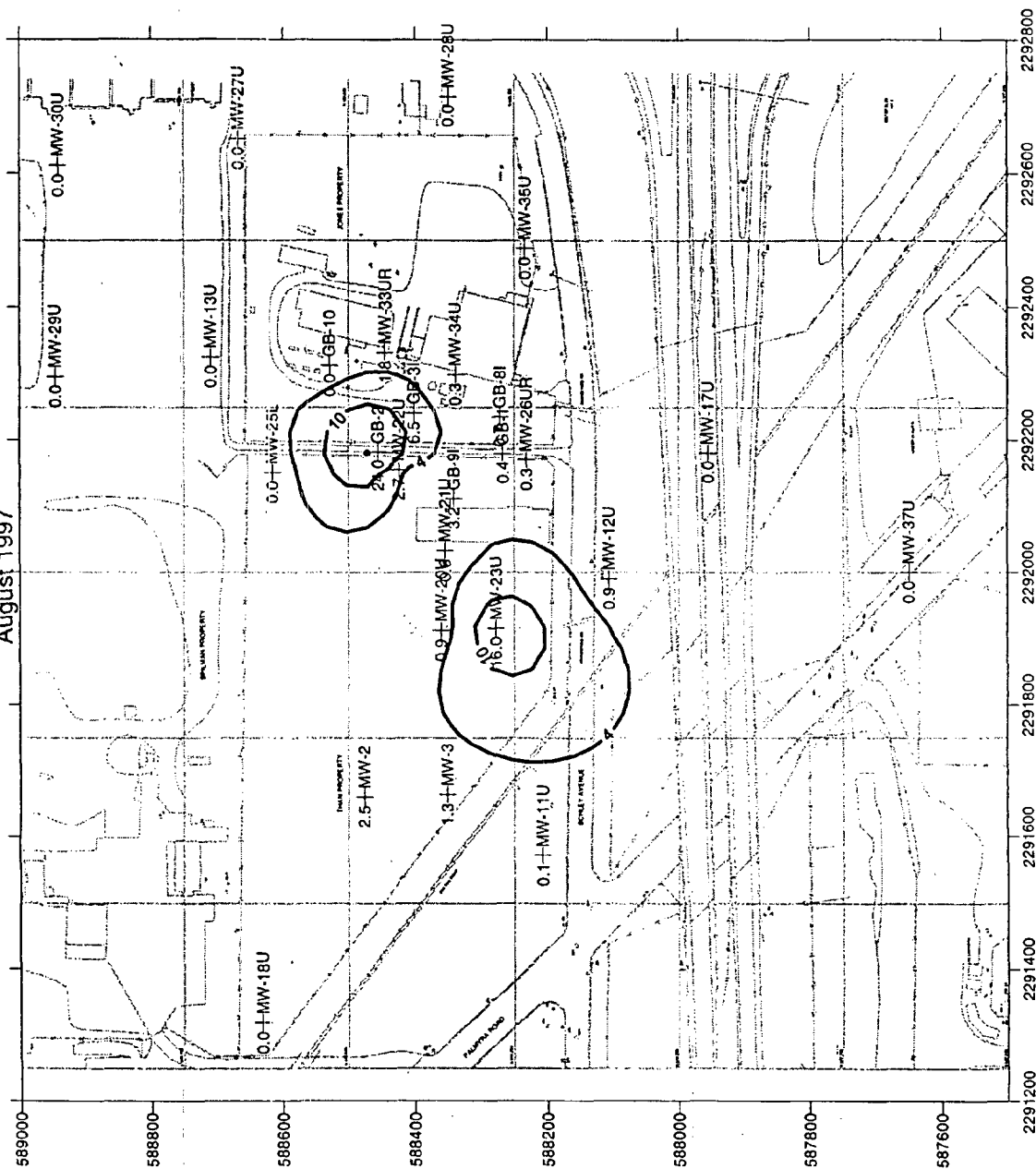
α-BHC (µg/L)  
September 1991



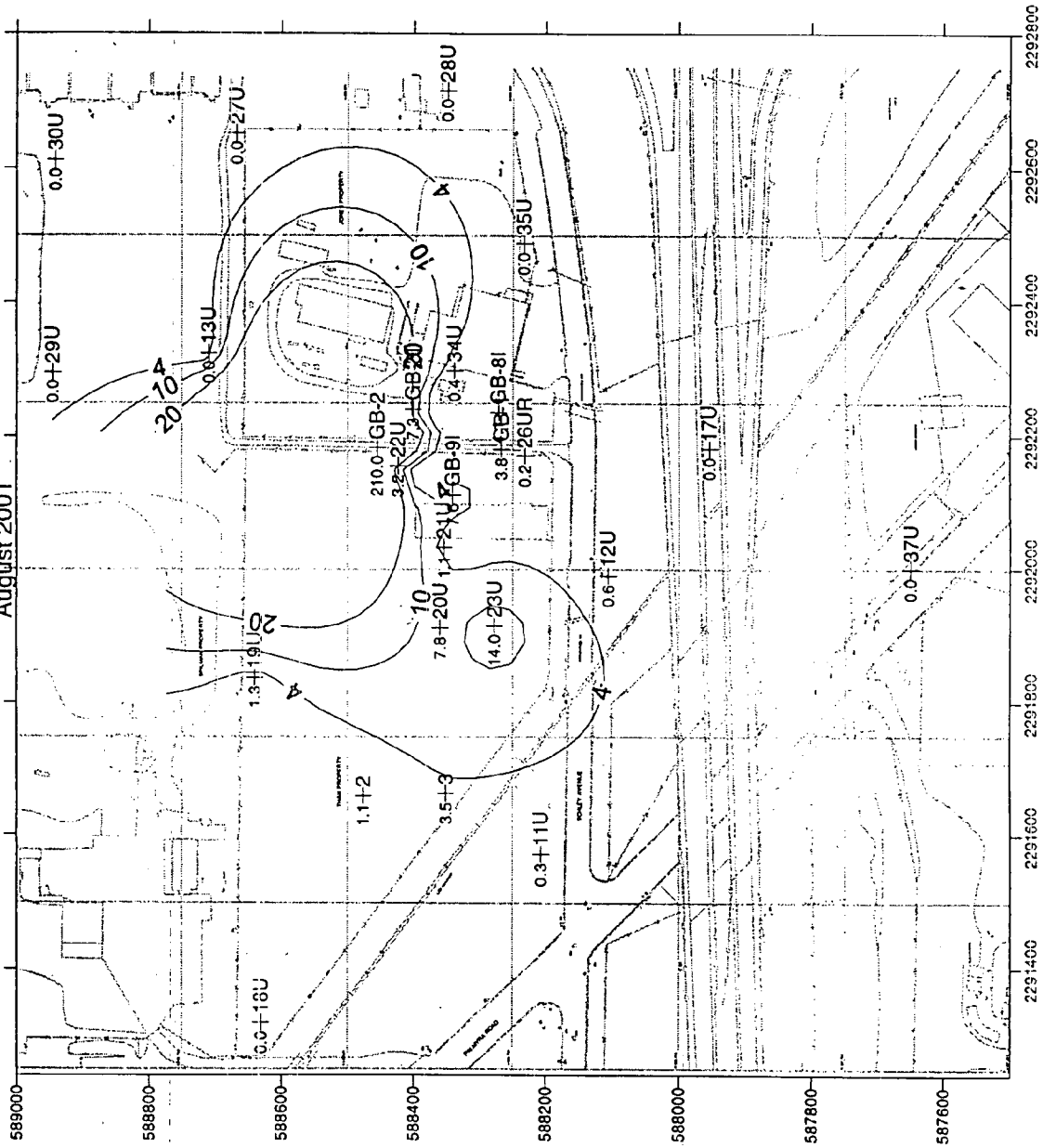
$\alpha$ -BHC ( $\mu\text{g/L}$ )  
June 1994



$\alpha$ -BHC ( $\mu\text{g/L}$ )  
August 1997



$\alpha$ -BHC ( $\mu\text{g/L}$ )  
August 2001

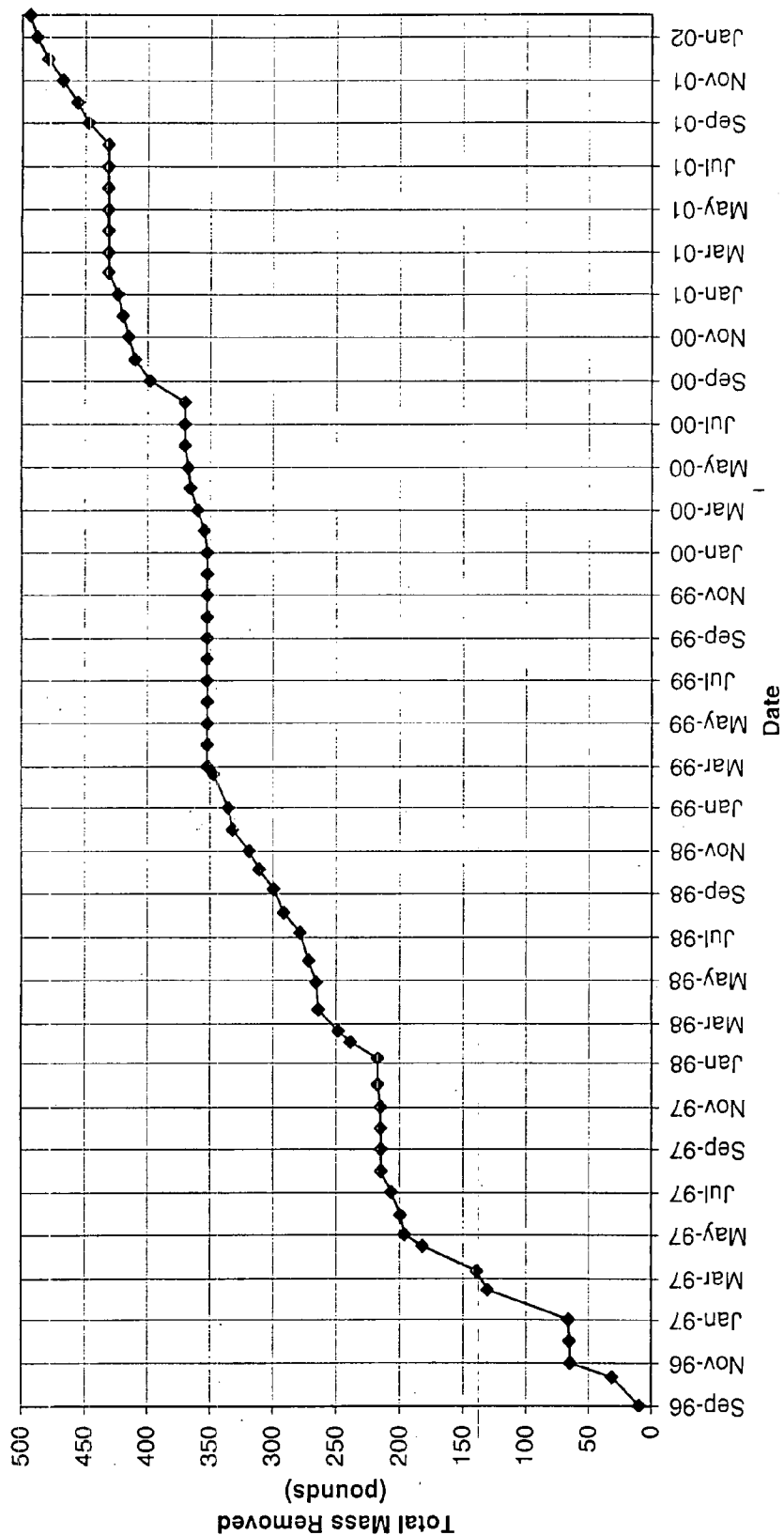


## APPENDIX C

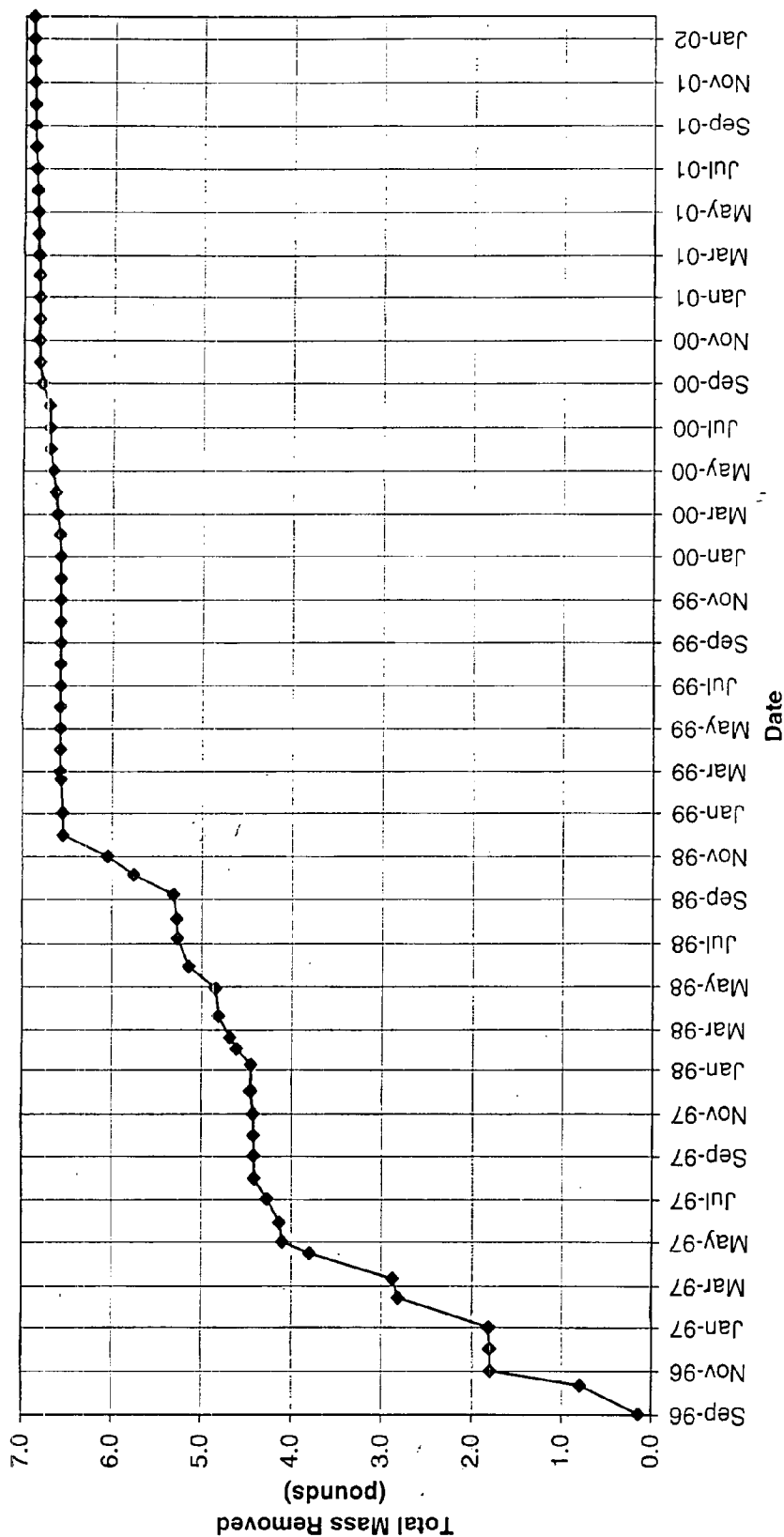
### GRAPHS

Graph 1

Estimated Cumulative Total Mass of Compounds of Concern  
Removed from Groundwater,  
September 1996 to February 2002  
T H Agriculture & Nutrition, Albany, Georgia



Graph 2  
**Estimated Cumulative Mass of RAO Compounds  
 Removed from Groundwater,  
 September 1996 to February 2002**  
 T H Agriculture & Nutrition, Albany, Georgia





Graph 3  
 Cumulative Total Gallons of Groundwater Extracted  
 September 1996 to February 2002  
 T H Agriculture & Nutrition, Albany, Georgia

